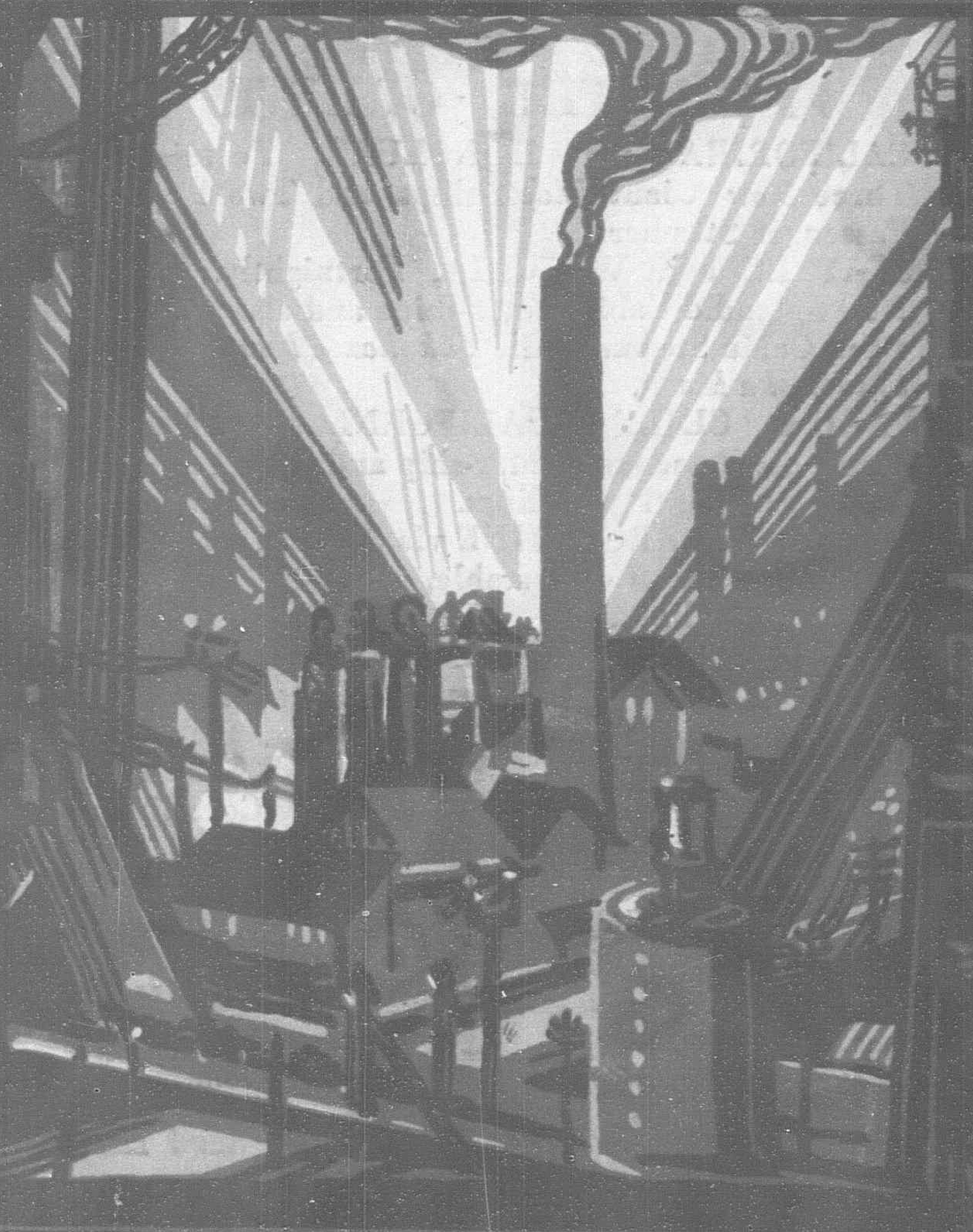
ENGINEERING FINANCE COMMERCE

THE FAR EASTERN REVIEW

遠東時報

上海黃浦灘念四號



AGAIN, STAY OUT OF IT!
BASIC PROBLEMS
OUR FRIENDSHIP FOR CHINA
THE GREAT MISTAKE

Vol. XXVIII JANUARY, 1932 No. 1

NYK LINE

PASSENGER SERVICES OF DISTINCTION FROM THE ORIENT

To CALIFORNIA via HONOLULU, Fortnightly. Three New Giant Motor-ships and Two Popular Passenger Steamers.

To SEATTLE and VICTORIA, Fortnightly. Three New Splendid Cabin Motor-ships and also Medium-sized Cabin Steamers, the *Yokohama Maru* and the *Shidzuoka Maru.*

To PERU and CHILE via CALIFORNIA and MEXICO. New Elite Passenger Motor-ship and Four Excellent Steamers, Monthly Sailings.

To BRAZIL and ARGENTINE via SOUTH AFRICAN PORTS. Six Comfortable, Steady Steamers, Monthly Sailings.

To MARSEILLES and LONDON via SUEZ, Fortnightly. Two New Passenger Motor-ships and Eight Modern Passenger Steamers.

To AUSTRALIA via PHILIPPINES and CELEBES, Monthly. Service Vastly Improved by Commission of Three Faster Vessels.

To BOMBAY via SINGAPORE, Monthly. Three Medium-sized, Well-equipped Steamers.

CHINA-JAPAN RAPID EXPRESS SERVICE, Every 4 Days. S.S. *Nagasaki Maru* and S.S. *Shanghai Maru.*

Full Particulars Obtainable at the Company's Offices and Agencies Located at all Important Cities and Ports Throughout the World.

N.Y.K., General Passenger Agents for Cunard Line

N. Y. K. LINE

Offices in China:
Shanghai, 31 The Bund
and also at:
Hankow, Canton, Dairen,
Tsingtao, Tientsin

FOUNDED, 1904

The Far Eastern Review

ENGINEERING ✣ FINANCE ✣ COMMERCE

THE PIONEER IN ITS FIELD

A Monthly Review of Far Eastern Trade, Finance and Engineering, Dedicated to the Industrial Development and Advancement of Trade in Far Eastern Countries.

HEAD OFFICE: YOKOHAMA SPECIE BANK BUILDING: SUITES NO. 21 AND 21B, 24 THE BUND,
SHANGHAI, CHINA.

GEORGE BRONSON REA, *Editor and Publisher*

NEW YORK: J. D. Hamilton Co., Inc., 50 Church Street.
GREAT BRITAIN: Walter Judd, Ltd., 47 Gresham Street, London, E.C.2
BERLIN: Rudolf Mosse, 46-49 Jerusalemer Strasse.

SUBSCRIPTION IN CHINA: $10.00 Mexican, U. S. & Philippines Gold $5.00, Elsewhere $12.00 Mexican per annum.

Vol. XXVIII JANUARY, 1932 No. 1

CONTENTS:

	PAGE
AGAIN, STAY OUT OF IT!	1
BASIC PROBLEMS	3
OUR FRIENDSHIP FOR CHINA	6
VISCOUNT SHIBUSAWA PASSES	*8
JAPAN'S AIMS IN MANCHURIA	*9
THE GREAT MISTAKE	10
A FEW AERONAUTICAL SIDELIGHTS	14
THE STEEL INDUSTRY OF JAPAN	16
NEW RAILWAY IN CHEKIANG	19
THE SHANGHAI COAL HANDLING PLANT OF THE KAILAN MINING ADMINISTRATION	*20
ELECTRIC POWER IN FORMOSA	*26
NEW EDIFICE IS OF STRIKING DESIGN	*27
ELECTRICAL ENGINEERING IN CEYLON	*30
DIESEL ENGINES SOLVE PROBLEM OF SMALL PUBLIC UTILITIES	*33
THE USE OF HYDRO-ELECTRIC POWER IN THE U.S.S.R.	*34
F. L. SMIDTH & CO. A/S HAS FIFTIETH ANNIVERSARY	*37
THE RECONSTRUCTION OF TOKYO AND AESTHETIC PROBLEMS OF ARCHITECTURE	*39
ARC-WELDING IN JAPAN	*44
THE KOBE SHIPYARD AND ENGINE WORKS OF THE MITSUBISHI SHIPBUILDING AND ENGINEERING CO., LTD.	*45
YARROW & CO. BUILD VESSEL FOR YUGOSLAV GOVERNMENT	*50
RECENT DEVELOPMENT OF FISHERIES MOTOR CRAFT IN JAPAN	*51
ENGINEERING NOTES	56

**Illustrated with Maps or Photographs*

Registered at the Chinese Post Office as a Newspaper.

ALPHABETICAL LIST OF ADVERTISERS

Allen & Co., Ltd., Edgar 16
American Locomotive Sales Corp. .. 7
American Mail Line 41
American Oriental Banking Corp. .. 39
American Oriental Finance Corp. .. 39
American Trading Co. 21
Andersen, Meyer & Co., Ltd. .. 35
Arnhold & Co., Ltd. 24
Asia Realty Co., Fed., Inc., U.S.A. 39
Attwater & Sons 38
Avery, Ltd., W. & T. 13

Babcock & Wilcox, Ltd. 25
Bank of China 50
Bank of Chosen 53
Bank of Communications 51
Bank of Taiwan, Ltd. 50
Birmingham Wireworks Co., Ltd. .. 38
British-American Tobacco Company (China), Ltd. 9
British Steel Piling Co., Ltd. .. 46
Bucyrus-Erie Company 17
Buss Ltd. 42
Butterfield & Swire 32

Canadian Pacific Railway Co. .. 19
Chekiang Industrial Bank, Ltd., The 46
Chemical Engineering & Wilton's Patent Furnace Co., Ltd. .. 42
Craven Brothers (Manchester) Ltd. 13

Dai-Ichi Ginko Ltd. 52
Dai Nippon Boseki Kaisha 27
Dai Nippon Brewery Co. 34
Demag Aktiengesellschaft, Duisburg 11
Dollar Co., The Robert 41
Dollar Steamship Line 41

Evans & Sons (Wolverhampton) Ltd., Joseph 8

Far East Oxygen & Acetylene Co., Ld. 43
Fuji Gassed Spinning Co. 26

Gleniffer Engines Ltd. 46
Gutehoffnungshuette—M.A.N.Works 33

Hardivilliers F. 31
Hasler Telegraph Works 42
Hongkong & Shanghai Banking Corporation 47
Hongkong & Whampoa Dock Co., Ltd. 4

Imperial Japanese Government Railways 57
Industrial Bank of Japan, Ltd. .. 53

Japan Sugar Mfg. Co., Ltd. .. 34
Jardine Engineering Corporation Ltd., The .. .. Cover
Jebsen & Co. 2

Kailan Mining Administration .. 17
Kanegafuchi Spinning Co., Ltd. .. 26
Kawasaki One Hundredth Bank, Ltd. 47
Kaye & Sons, Ltd., Joseph .. 46

League of Nations—International Labor Office 44

Maschinenfabrik Augsburg—Nurnberg, A. G. 33
Metropolitan Vickers Electrical Co., Ltd. 15
Ministry of Railways, National Government of China . .. 54
Mitsubishi Aircraft Co., Ltd. .. 20
Mitsubishi Bank, Ltd. 49
Mitsubishi Denki Kabushiki Kaisha 6
Mitsubishi Iron & Steel Co., Ltd. . 18
Mitsubishi Marine & Fire Ins. Co., Ltd. 52
Mitsubishi Mining Co., Ltd.. .. 20
Mitsubishi Shoji Kaisha 14
Mitsubishi Trust Co., Ltd. . .. 52
Mitsubishi Warehouse Co., Ltd. .. 18
Mitsubishi Zosen Kaisha 44
Mitsui Bank, Ltd. 49
Mitsui Bussan Kaisha Ltd. . .. 12
Mitsui Mining Co., Ltd. 14

Naigai Wata Kabushiki Kaisha .. 27
Nanking-Shanghai Railway .. 55
National City Bank of New York . 45
Nippon Menkwa Kabushiki Kaisha 20
Nippon Yusen Kaisha .. Cover
North-China Sunday News . .. 22

Okura & Co. 8
Osaka Godo Cotton Spinning Co. . 28
Osaka Shosen Kaisha 30
Osborn & Co., Ltd., Samuel .. 40

Petters, Ltd. 3
Port of Seattle 17
Priestman Bros., Ltd. 29

Raven Trust Co., Fed., Inc., U.S.A. 39
Reyrolle & Co., Ltd., A. 19
Rose, Downs & Thompson (Far East) Ltd. 16

Shanghai-Hangchow-Ningpo Railway 55
Shanghai Power Co. 5
Shanghai Telephone Co. 42
Skoda Works 31
Smidth & Co., A/S., F. L. 25
Societe Francaise des Telephones Interurbains. 40
South Manchuria Railway Co. 58, 59, 60
Standard Oil Co., of N. Y. 23
States Steamship Co. 33
Sulzer Bros. 36, 37
Sumitomo Goshi-Kaisha 48
Sumitomo Bank Ltd. 48

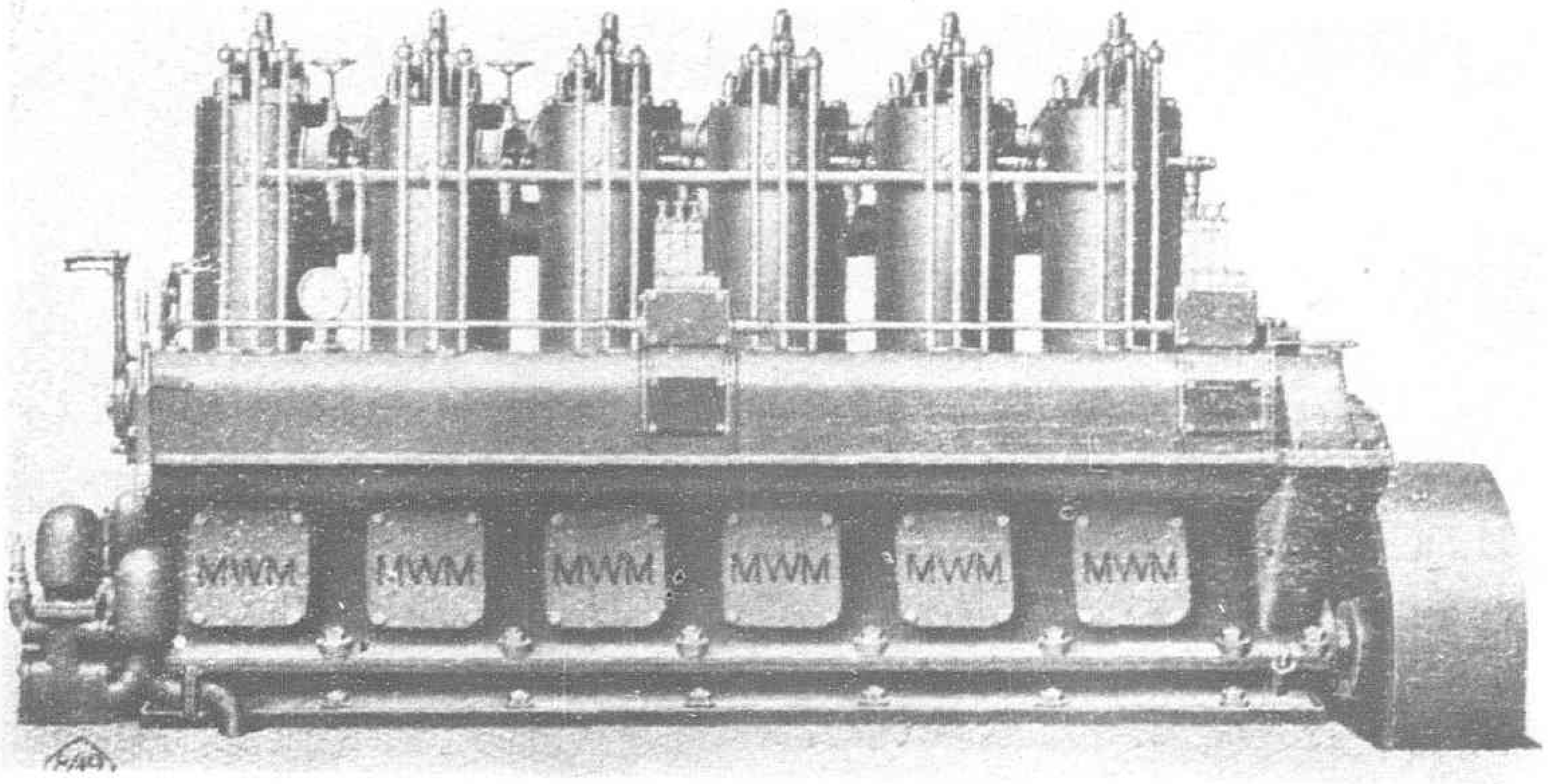
Taiwan Seito Kabushiki Kaisha .. 24
Thornycroft & Co., Ltd., John I .. 3
Tientsin-Pukow Railway 56
Toshin Soko Kaisha 10
Toyo Boseki Kaisha 28
Toyo Menka Kaisha Ltd. 20

Ujigawa Electric Power Co., Ltd. .. 34

Walker & Son, Ltd., Thos... .. 42
Williams & Co., J. H. 43

Yasuda Bank, Ltd. 51
Yokohama Specie Bank, Ltd. Cover
York Ice Machinery Corporation .. 29

BENZ-PATENT CRUDE OIL ENGINES



Special light type for Launches, Motor Vessels and River Boats

The "Benz-Patent" Crude Oil Engines are Cheap in USE, simple in CONSTRUCTION and always SATISFACTORY in WORK

First Class Diesel Engines for

ROAD CONSTRUCTION, STONE CRUSHING FACTORIES, POWER PLANTS, FACTORIES AND WORKSHOPS

Estimates and booklets free from the Agents:

JEBSEN & CO., 7 Hankow Road, SHANGHAI

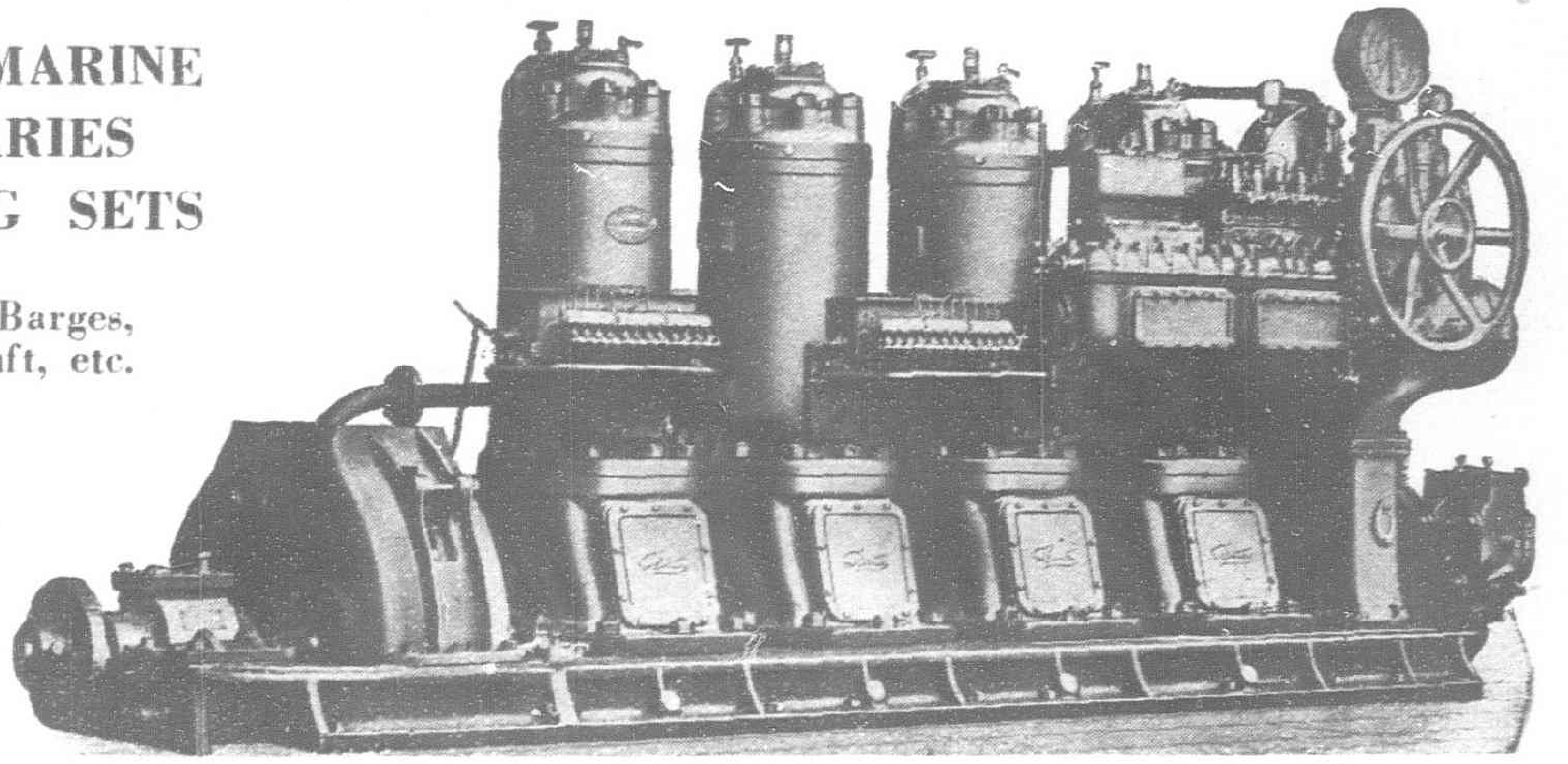
ATOMIC DIESEL

COLD-STARTING HEAVY-OIL ENGINES

Sizes up to 400 B.H.P.

STATIONARY AND MARINE
MARINE AUXILIARIES
ELECTRIC LIGHTING SETS

For Yachts, Tugs, Launches, Barges, Fishing Vessels, Trading Craft, etc.



The illustration shows a 160 B.H.P. Atomic Diesel Marine Engine installed in the Burmah-Shell Oil Storage & Distributing Co's. Tug in the Far East.

Please write for Catalogues:

Agents for China:
The General Electric Co., of China, Ltd.,
23-27 Ningpo Road, Shanghai, and Queen's Building, Hongkong

Agents for Japan:
Mitsubishi Shoji Kaisha, Ltd.,
Maru-no-uchi, Tokyo

Manufactured by PETTERS LIMITED, Works YEOVIL, ENGLAND

The manufacture of the famous Westland Military and Civil Aeroplanes is also a branch of the business of Petters Limited

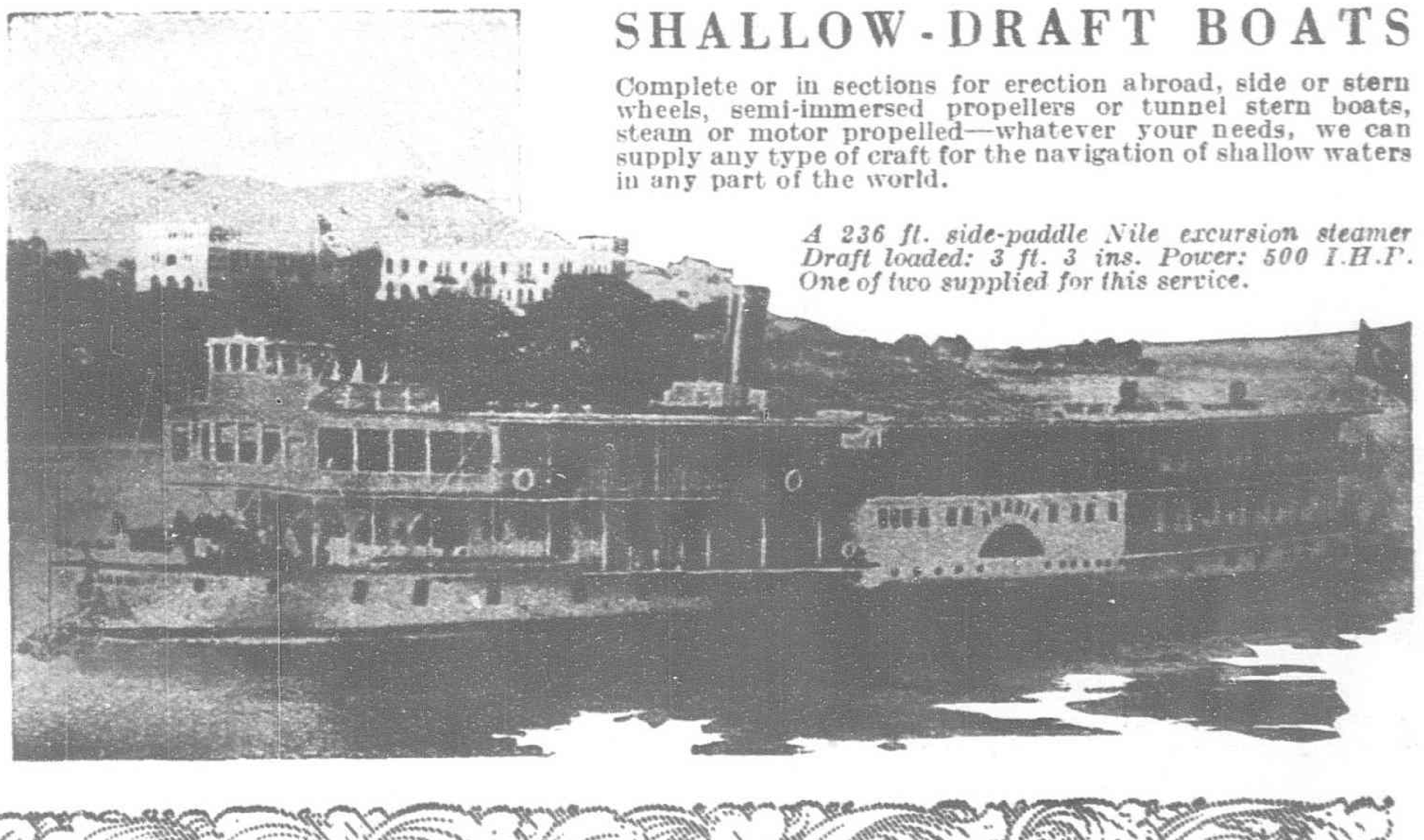
JOHN I. THORNYCROFT AND CO LIMITED

ENGINEERS SHIPBUILDERS & SHIP-REPAIRERS

- TORPEDO BOAT DESTROYERS
- PASSENGER AND CARGO VESSELS
- SHALLOW DRAFT BOATS. TUGS
- STEAM & MOTOR BOATS & YACHTS
- TURBINES AND RECIPROCATING MACHINERY
- WATER TUBE BOILERS
- OIL FUEL GEAR
- PROPELLERS
- SHIP-REPAIRS & OVERHAULS
- STATIONARY & MARINE MOTORS
- COMMERCIAL MOTOR VEHICLES

SHALLOW-DRAFT BOATS

Complete or in sections for erection abroad, side or stern wheels, semi-immersed propellers or tunnel stern boats, steam or motor propelled—whatever your needs, we can supply any type of craft for the navigation of shallow waters in any part of the world.



A 236 ft. side-paddle Nile excursion steamer Draft loaded: 3 ft. 3 ins. Power: 500 I.H.P. One of two supplied for this service.

Full particulars of our productions obtainable from our Branches at:

Robert Dollar Building,
3 Canton Road, Shanghai

Thornycroft House,
Tank Road, Singapore, F.M.S.

48 Diamond Harbour Road,
Calcutta, India

THE

HONGKONG & WHAMPOA DOCK CO.

LIMITED,

HONGKONG

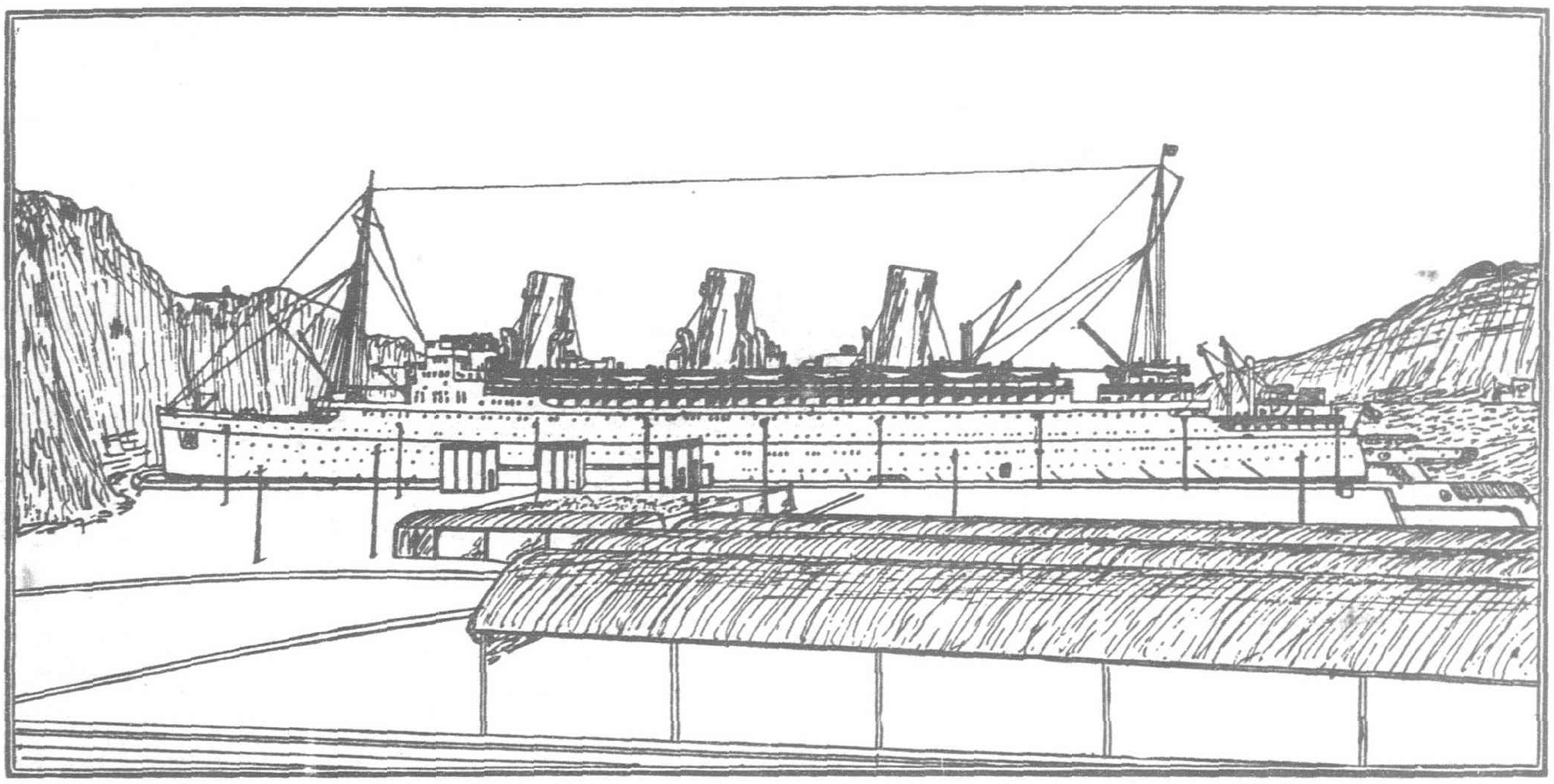
BUILDERS AND REPAIRERS OF SHIPS AND ENGINES OF ALL KINDS

and Makers of

BOILERS, IRON, STEEL and BRASS CASTINGS, FORGINGS and CONSTRUCTIONAL STEEL WORK, RAILWAY ROLLING STOCK, Etc.

Dock Owners, Salvors, Ship Builders, Marine and Land Engineers, Boiler Makers, Iron, Steel and Brass Founders, Forge Masters, Welders and Electricians

On Lloyds list of approved Cast Steel Manufacturers.



T. S. S. "EMPRESS OF JAPAN"

In No. 1 Dock.—Dims:-666 ft. O. A.×83 ft. 6 in.×48 ft. 6 in. Mld. 26,000 tons gross.

The Company possesses Six Granite Docks and Two Patent Slipways. The Dimensions of the No. 1 Dock are 700 ft.×88 ft.×30 ft. 6 in. over sill. H.W.O.S.T. Equipped for Expeditious Work. The Plant is of the most modern type throughout. Shipowners and Captains are assured that Docking and Repairs are carried out Promptly and at Moderate Charges. Sheerlegs capable of lifting 80 tons.

Harbour call flags:— Engineer " K." — Boilermaker " V." — Carpenter " I."

Salvage Tug " Henry Keswick," 2,000 I.H.P. Wireless Call Signal V.P.B.T. Flag Signal T.H.Q.B.

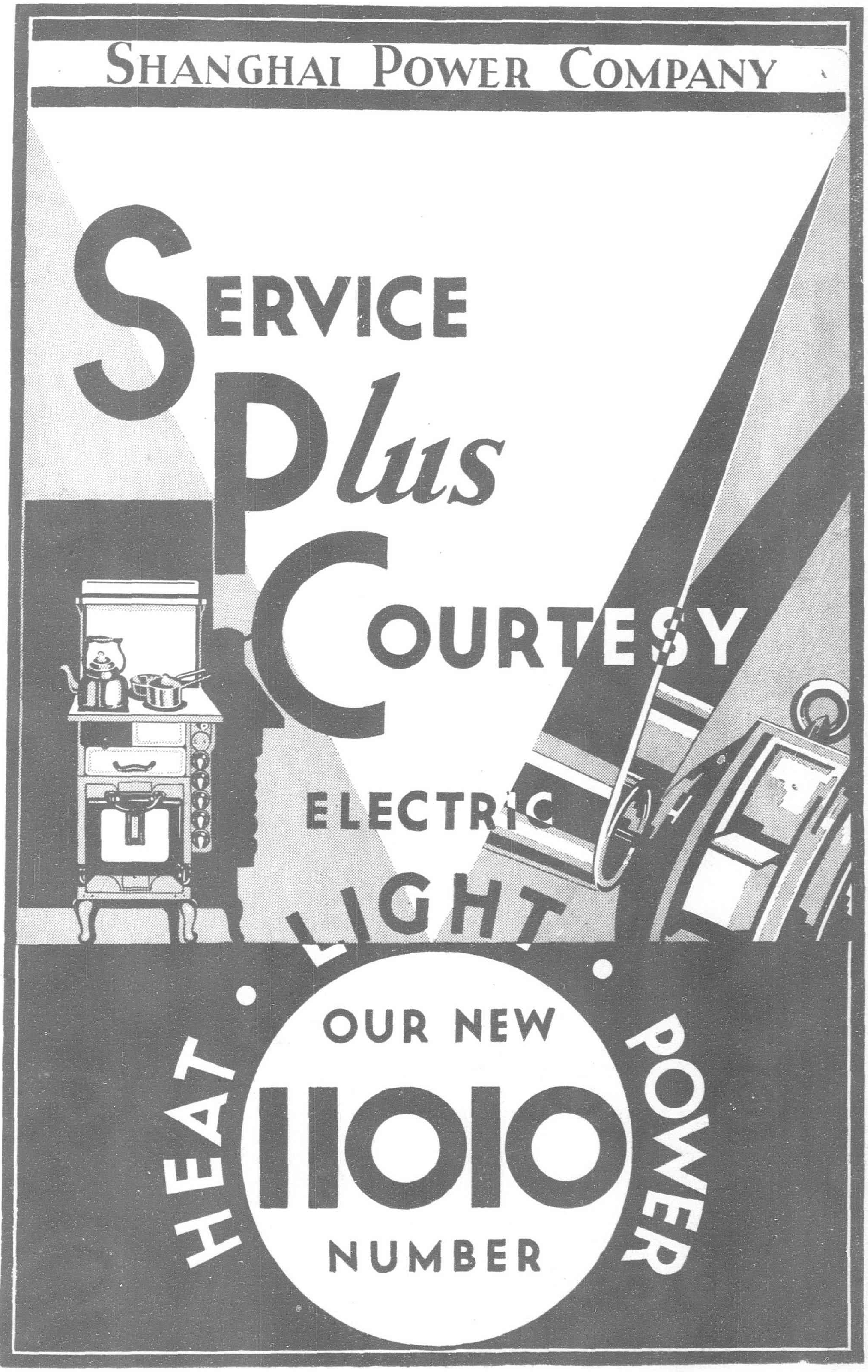
Address Enquiries to the Chief Manager, R. M. DYER, B.Sc., M.I.N.A., Kowloon Docks, Hongkong

HEAD OFFICE: KOWLOON
TELEPHONE No. 58053.

TOWN OFFICE: QUEEN'S BUILDINGS
TELEPHONE No. 28020.

TELEGRAPHIC ADDRESS: "MANIFESTO" HONGKONG

Codes used: A1; A.B.C., Fifth Edition; Engineering, First aud Second Editions; Western Union, Bentley and Watkins


SHANGHAI POWER COMPANY
SERVICE
Plus
COURTESY
ELECTRIC
LIGHT
HEAT
POWER
OUR NEW
11010
NUMBER

Telephones:
Marunouchi: 2131, 2141, 2151, 3837

Cable Address:
"IWASAKILEC TOKYO"

MITSUBISHI DENKI KABUSHIKI KAISHA

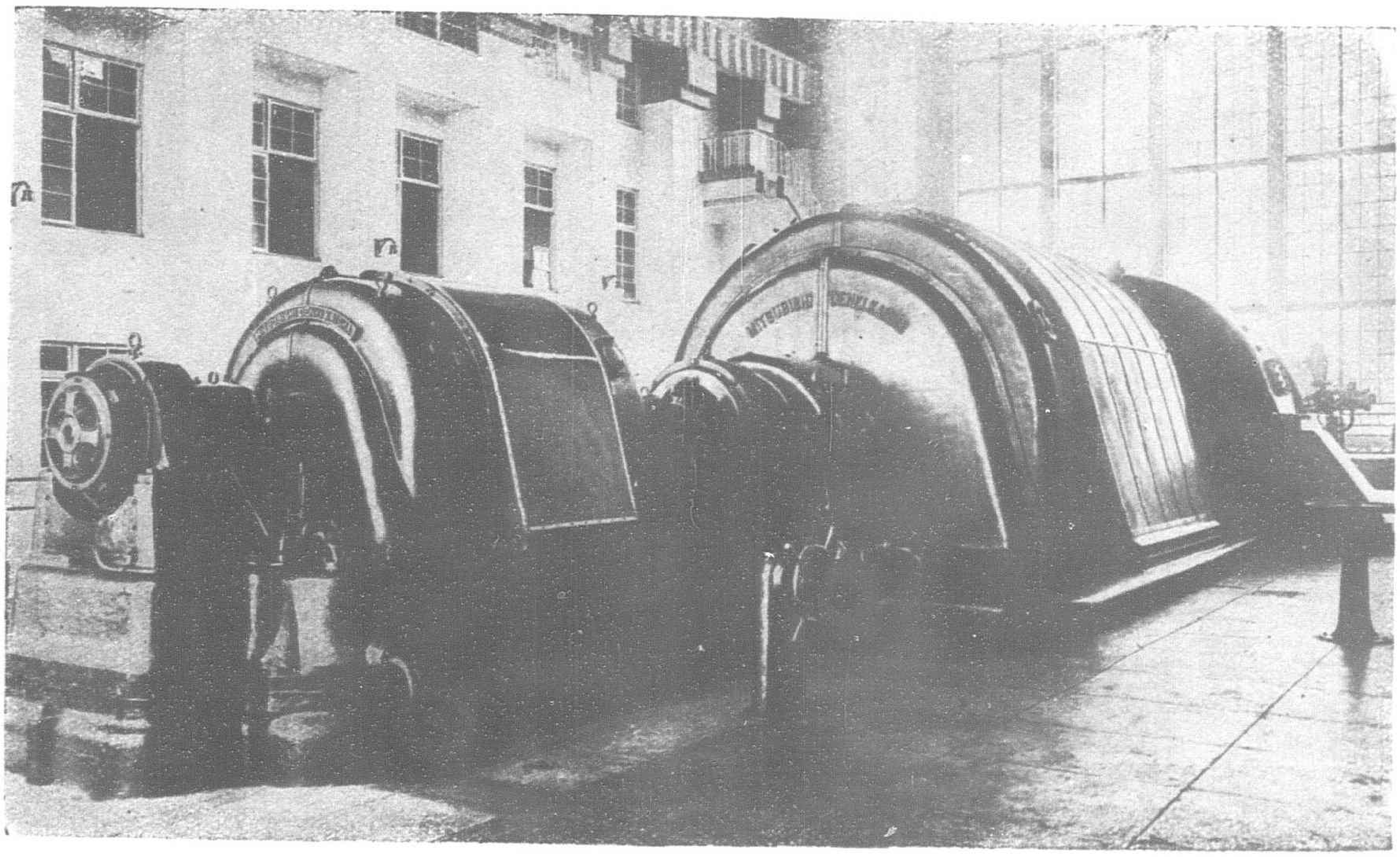
(Mitsubishi Electrical Engineering Co., Ltd.)

Head Office: Marunouchi, Tokyo

Kobe Works:
Wadamisaki, Kobe
Tel. Hyogo: 928, 929

Nagoya Works:
Yatamachi, Higashiku, Nagoya
Tel. Higashi: 6600, 6601

Nagasaki Works:
Koyamachi, Hirato, Nagasaki
Tel. 50, 51, 72



20,000 k.w. Steam Turbo-Generator for Imperial Japanese Steel Works

SPECIALITIES:

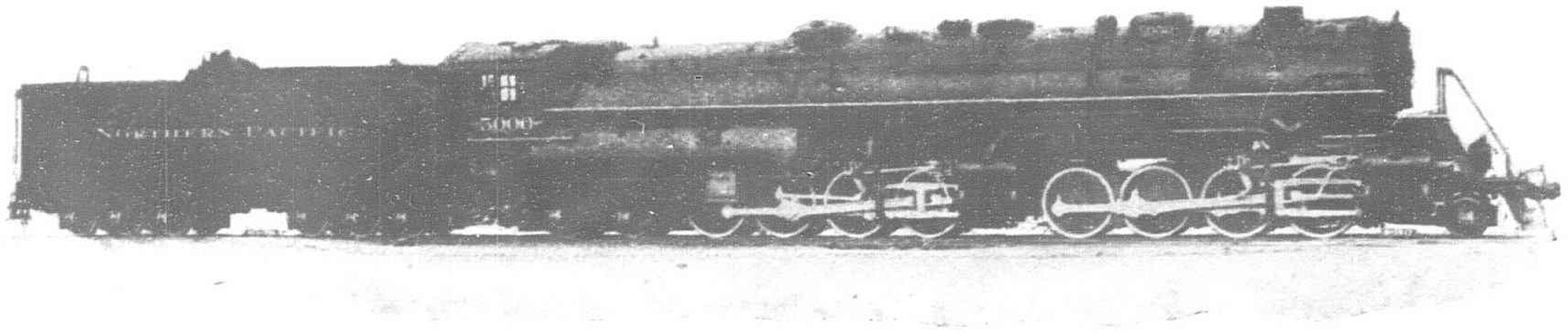
Hydro-Electric Power Plants
Steam Electric Power Plants
Equipment for Electric Railway System
Electric Equipment for Spinning and Weaving Mills
Motors and Other Electric Supplies for Factories
Electric Appliances for Agricultural Purposes
Household Electric Appliances
Other Electric Machinery, Apparatus and Instruments
Westinghouse Air Brakes, Automatic Coupler and Friction Draft Gear
Door Control Apparatus to the Designs of National Pneumatic Co., of America

Sole Agents: **Mitsubishi Shoji Kaisha, Ltd.**

(Mitsubishi Trading Co., Ltd.)

Tokyo, Osaka, Shanghai, Hongkong, Hankow, Dairen, Singapore, London, New York, Berlin, Pari

MOTIVE POWER OF TO-DAY



Weight on Drivers, 553,000 pounds; Weight of Engine, 717,000 pounds; Cylinders, 26 x 32-in; Diameter of Drivers, 63-in.; Boiler Pressure, 250 pounds; Maximum Tractive Power with Booster, 153,400 pounds.

In every field of productive activity there is always an organization which has attained a degree of success that is outstanding.

SUCH AN ORGANIZATION IS ALCO

Identified with railroad progress since railroads were new, its relationship to the development of transportation systems has been of a pioneering character.

It has brought out many locomotive types which have successfully solved pressing problems confronting the railroads, as their growth and importance demanded. In recent years, this has, in a very profound sense, become a constantly recurring responsibility which is always welcomed by the roads as more and more the railroad mechanical forces are faced with an increasing number of operating and maintenance problems.

The ALCO organization and the railroad industry are thus permanently and inseparably bound together which forms the true basis for transportation progress and locomotive economy.

AMERICAN LOCOMOTIVE SALES CORPORATION

30 Church Street, **NEW YORK CITY, N.Y., U.S.A.**

Telegraphic Addresses:

Locomotive : Peiping, China
Neled : Manila, P.I.
Dilpax : Honolulu, Hawaii

OKURA AND COMPANY

Capital: Yen 50,000,000 Paid-up

Partners:

BARON K. S. OKURA, *President* C. KADONO, *Vice-President*
K. M. OKURA

Affiliated Companies:

OKURA & CO. (Trading), Ltd.
M. YAMADA, *Managing Director (Tokio)*
T. MINAGAWA, *Director (Osaka)*

OKURA & CO. (Mining), Ltd.
R. SHIMAOKA, T. IWASE } *Managing Directors*

OKURA & CO. (Engineering & Contracting), Ltd.
N. YOKOYAMA, *Managing Director*

OKURA & CO. (Fire & Marine Insurance), Ltd.
I. HAYASHI, *President*
G. KAWAKUBO, N. OKURA, } *Managing Directors*

Head Office: Ginza, Tokio
Shanghai Office: No. 14 Canton Road
Shanghai Wharf: Yi-Cnong, Pootung
Branch Offices and Agencies: All over Japan, China, Europe and America

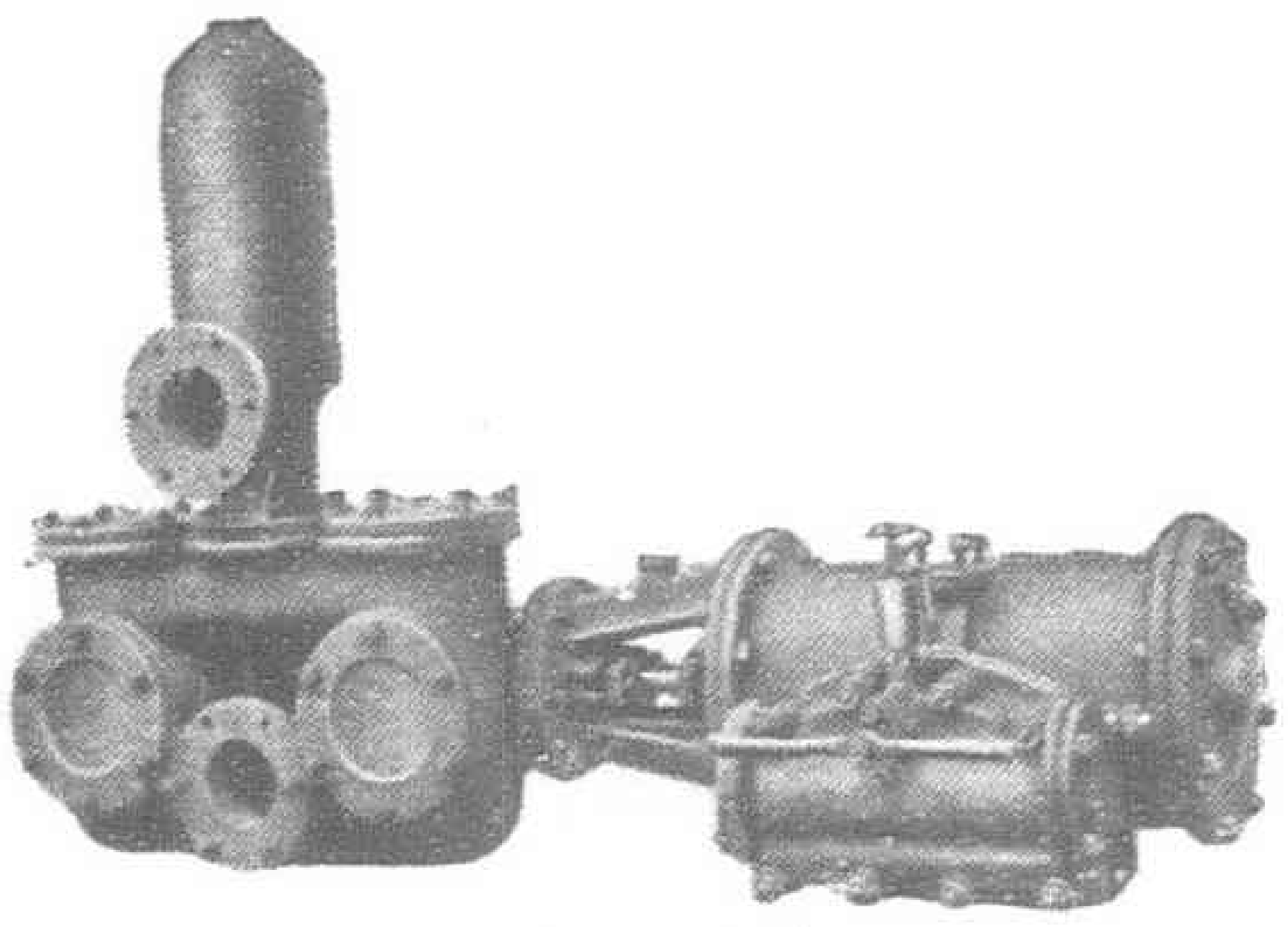


Fig. 600
Steam Pump for General Purposes

WE MANUFACTURE

PUMPS

FOR EVERY PURPOSE

To be worked by HAND, STEAM, BELT, WIND, WATER or ELECTRIC POWER

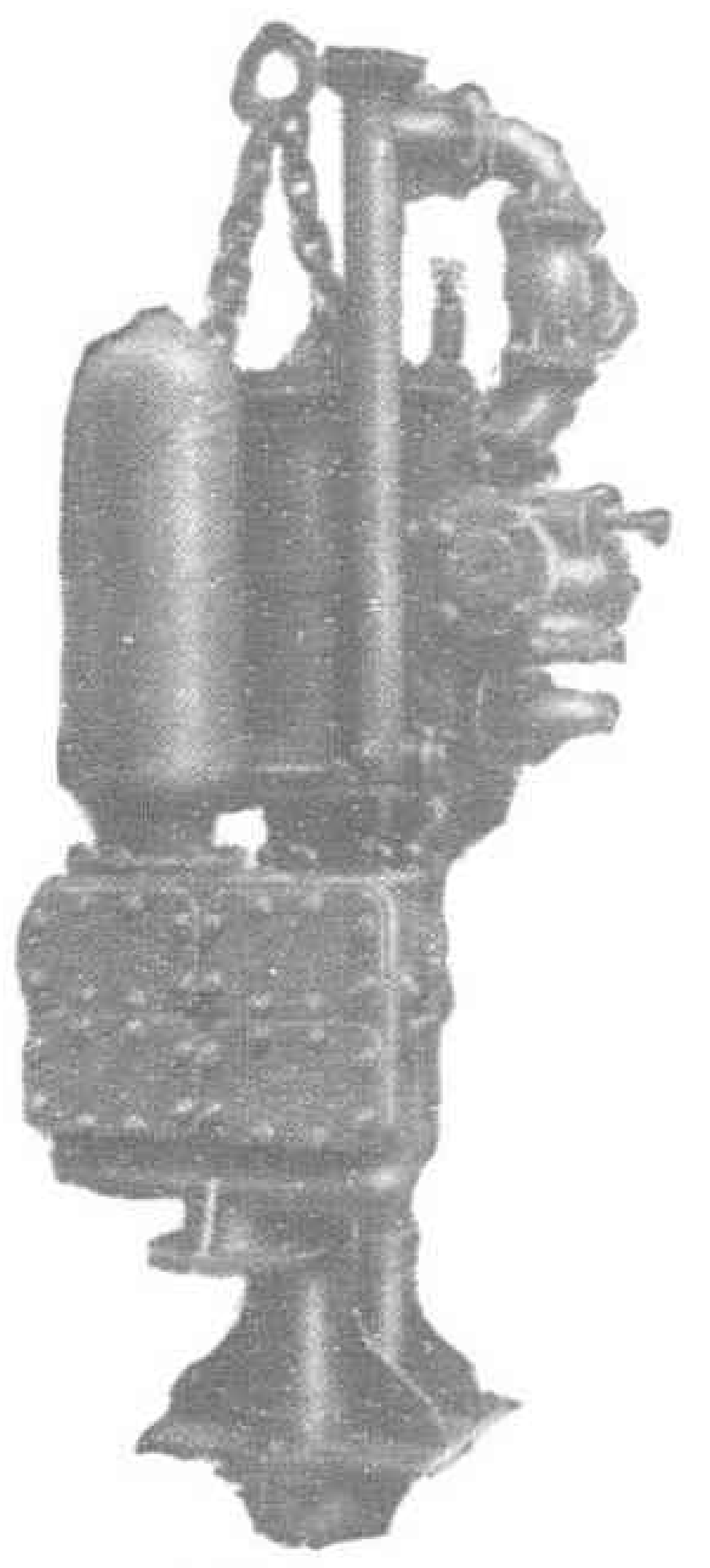


Fig. 620

Fig. 622

Sinking Pumps for Collieries, Mines, Etc.

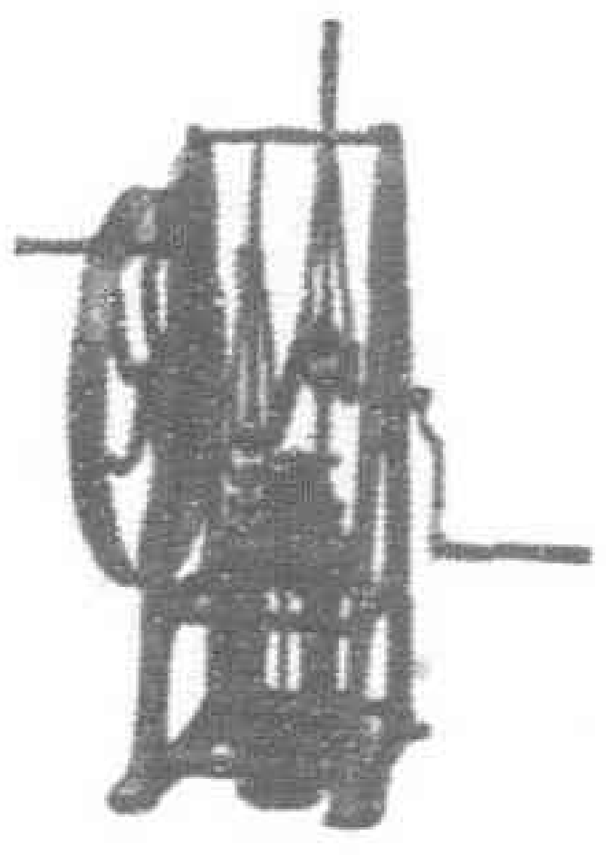


Fig. 227

Fig. 160c

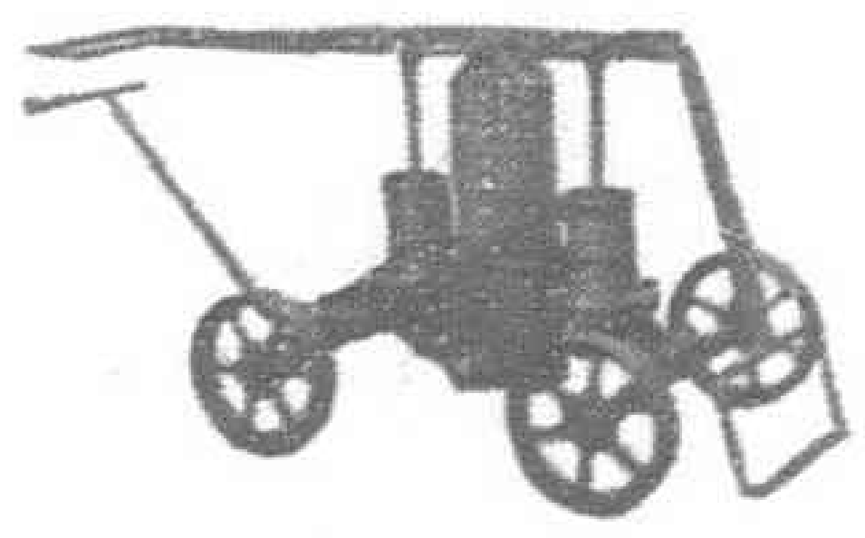


Fig. 199

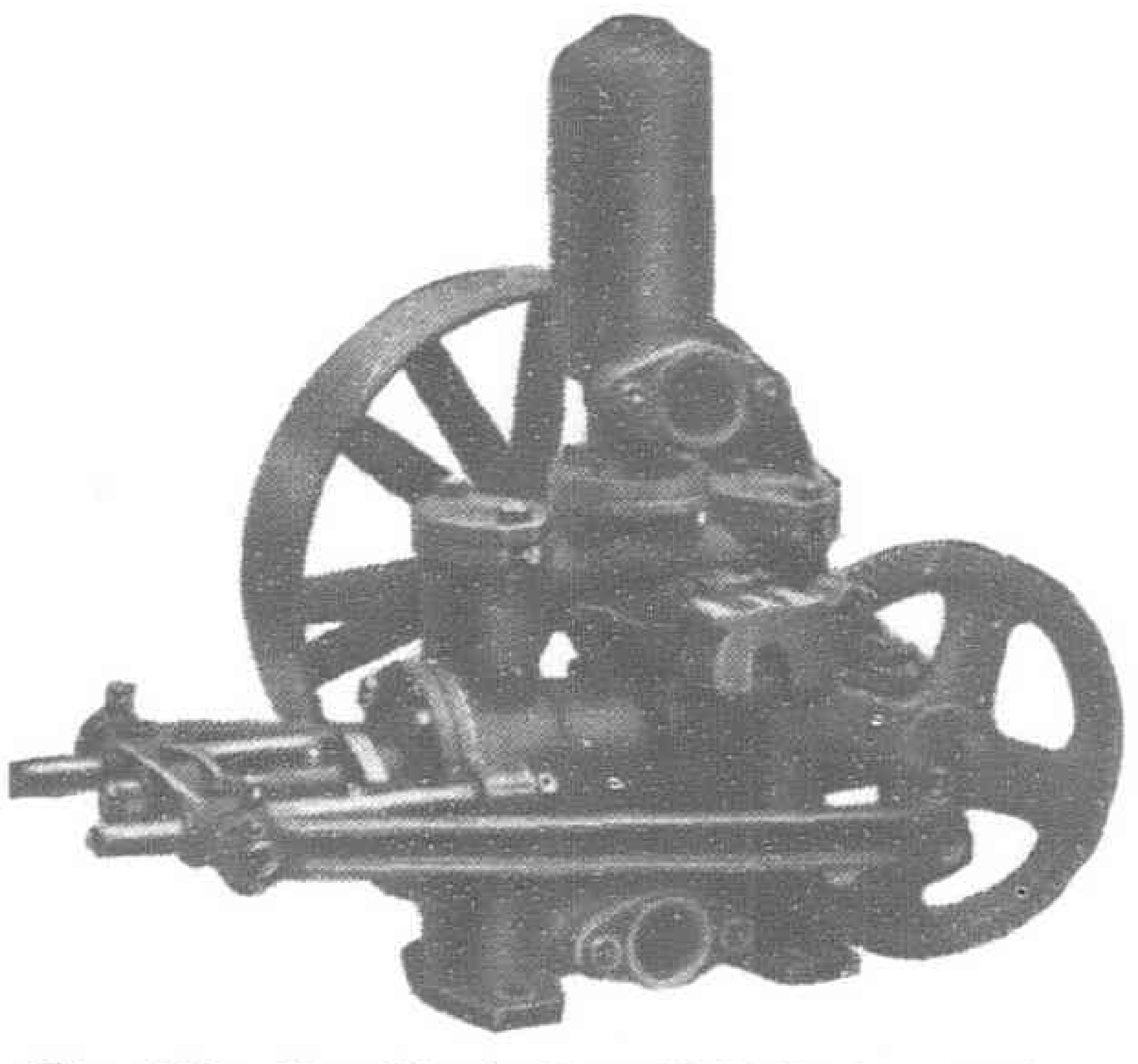


Fig. 831—Double Acting Belt Driven Pump

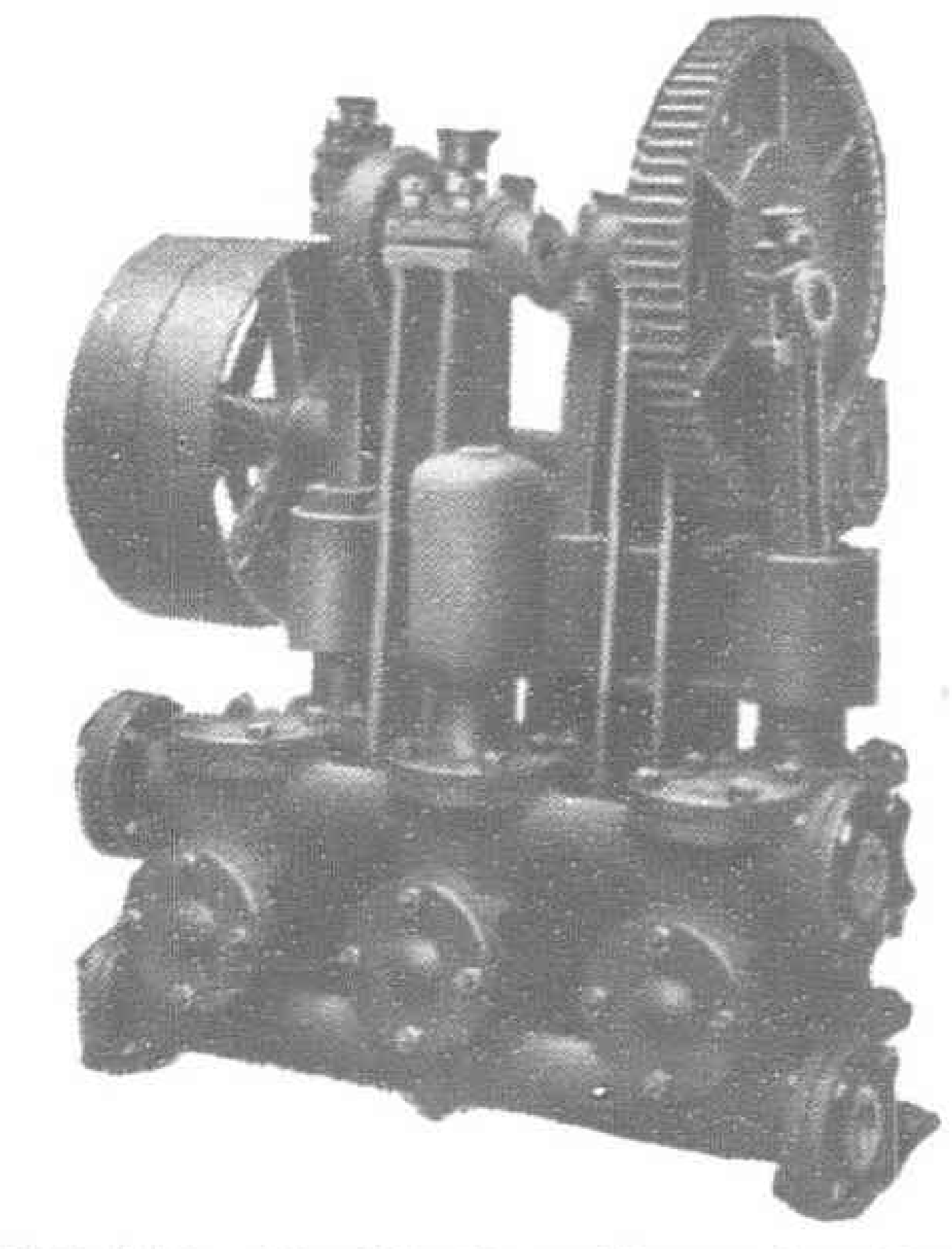


Fig. 842—Treble Ram Pump for Belt or Electric Drive

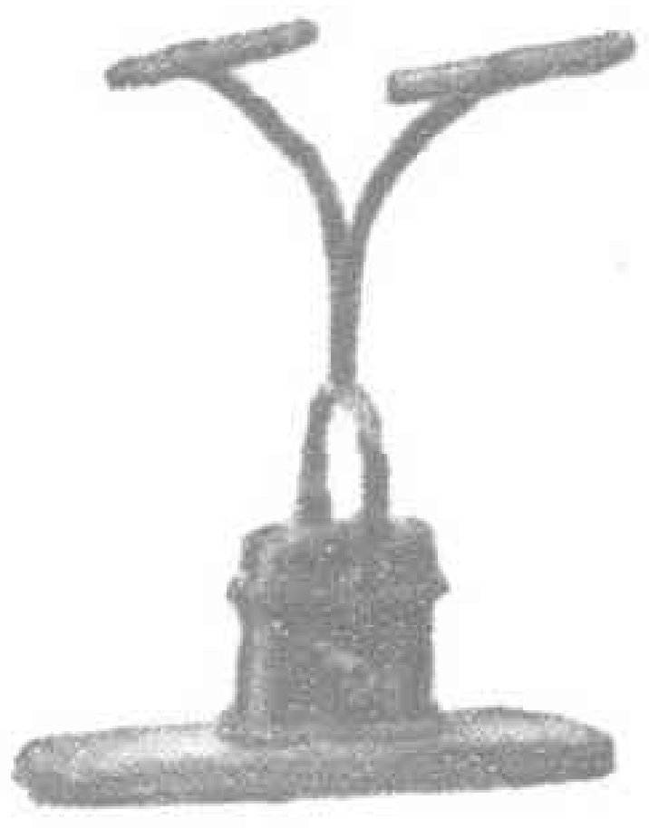


Fig. 191

Write for "Eastern" List.

JOSEPH EVANS & SONS
(WOLVERHAMPTON) LTD,
CULWELL WORKS,
WOLVERHAMPTON, ENGLAND.

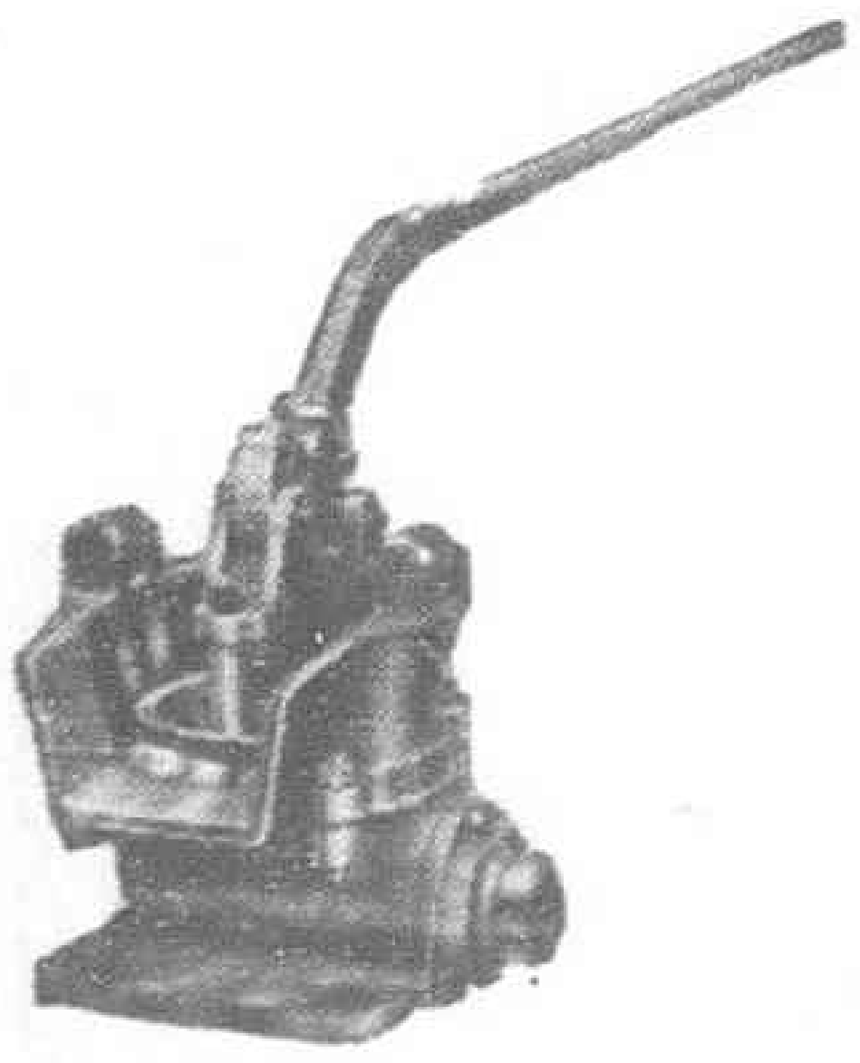


Fig. 208

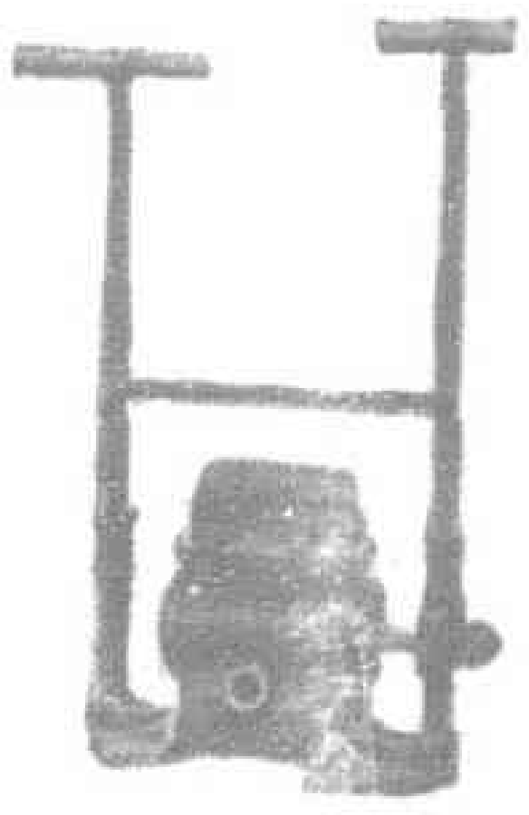


Fig. 187

EB-1119 This advertisement is issued by The British-American Tobacco Co., (China) Ltd

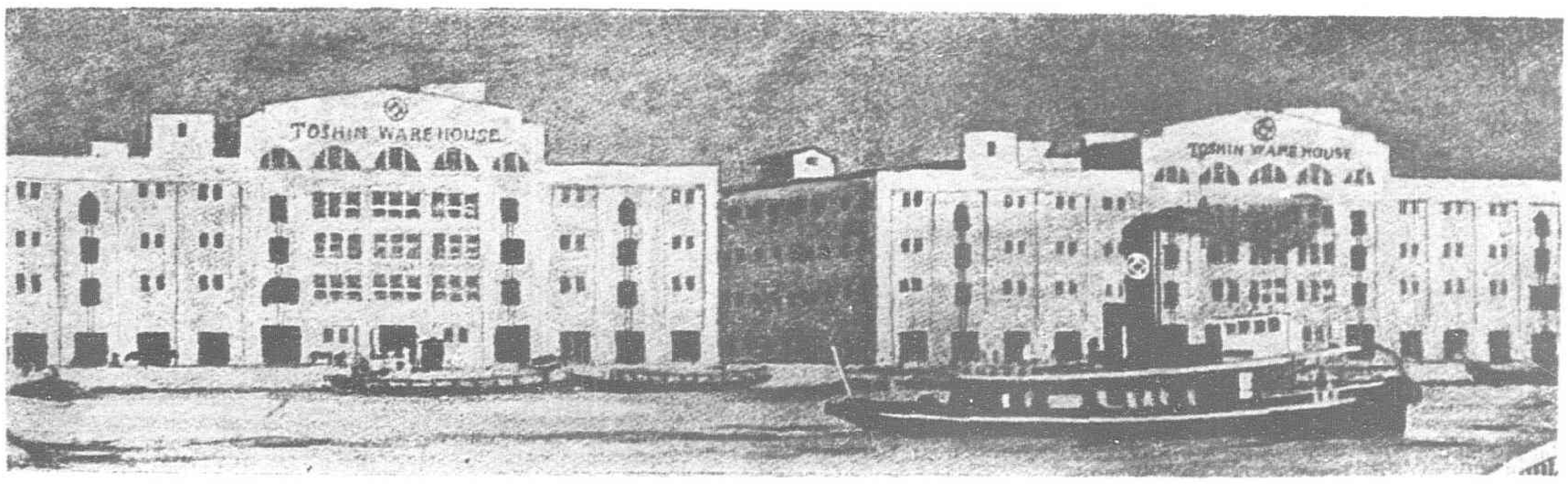
TOSHIN SOKO KAISHA

(THE TOSHIN WAREHOUSE CO., LTD.)

CAPITAL - - - - - Yen 15,000,000

Stevedoring, Landing, Express and Shipping Agents, Customs Brokers and Warehousemen

Complete with all Facilities and Thoroughly Equipped for Handling Stevedoring and Warehousing Business



Toshin Fire and Earthquake-Proof Bonded Warehouses at Kobe

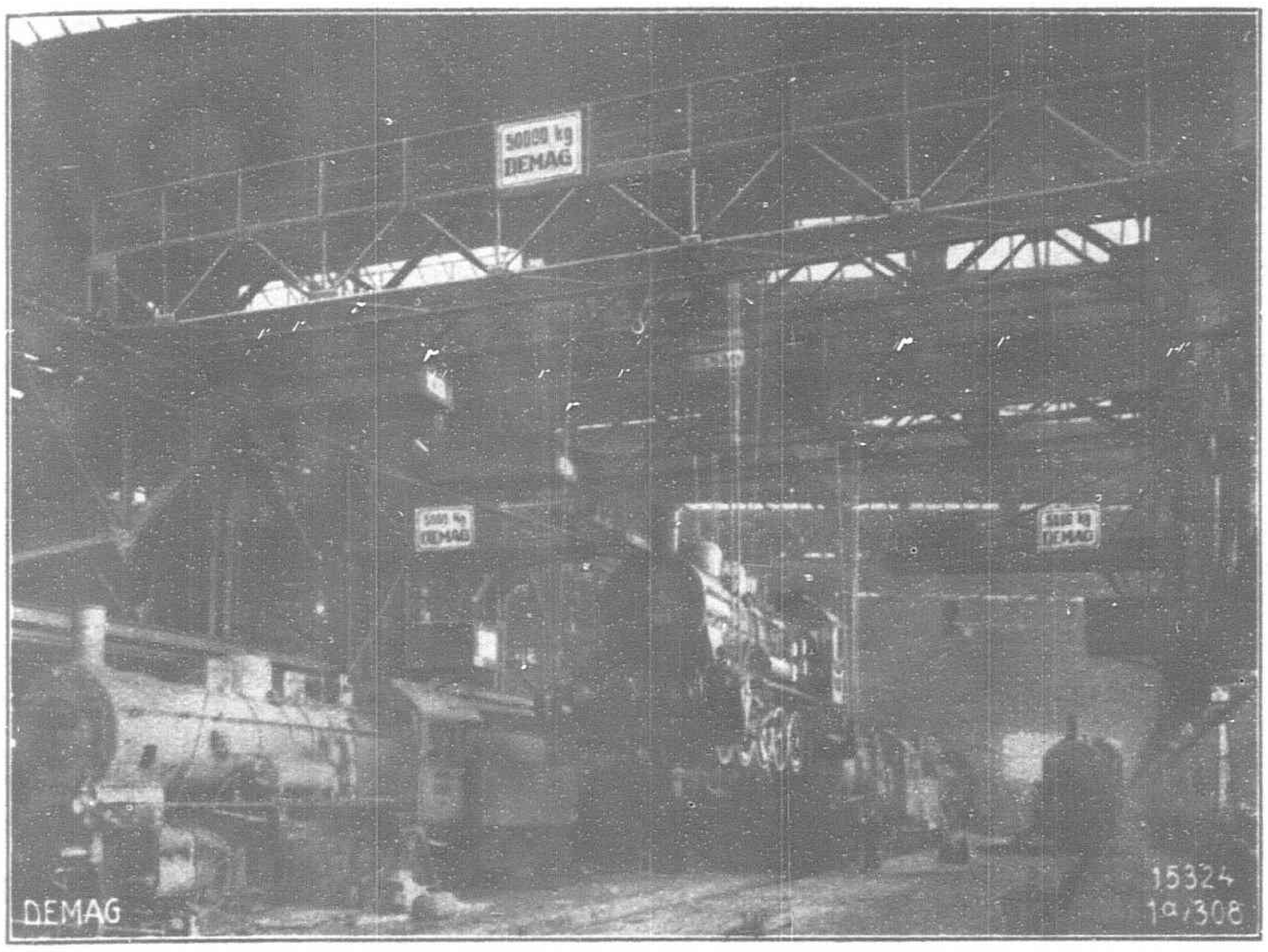
Chairman : K. FUKUI
Managing Directors : N. KATO AND T. TESHIMA
Directors : K. HAYASHI AND H. OKUMURA
Auditors : Y. KOSHI AND R. KADONO

HEAD OFFICE : No. 1 SURUGA-CHO, NIHONBASHI-KU, TOKYO

BRANCHES and SUB-BRANCHES:

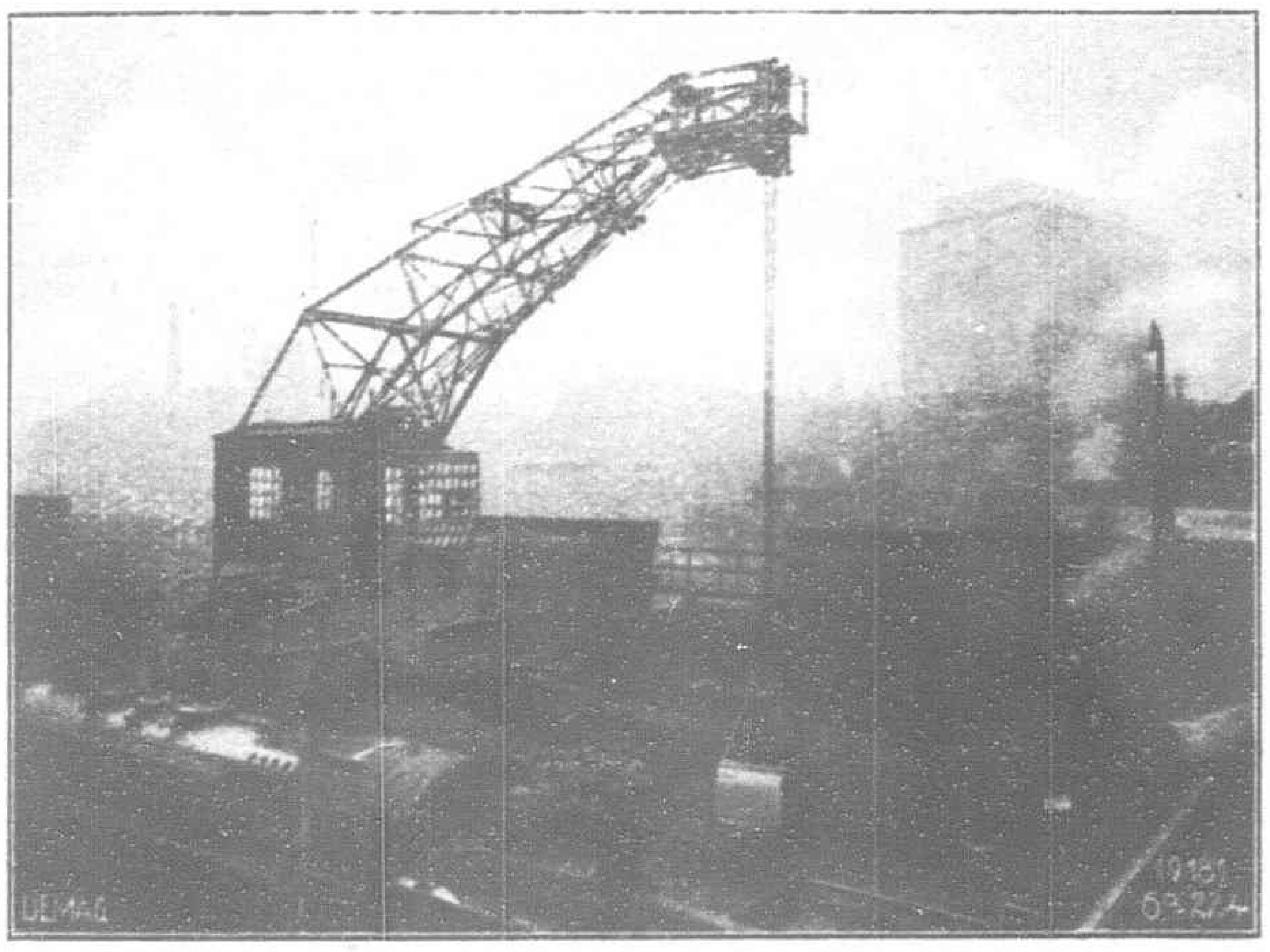
Tokyo, Yokohama, Nagoya, Yokkaichi, Osaka, Kobe, Moji and Shimonoseki.

THE PRACTICAL
DEMAG CRANES
for railway service!



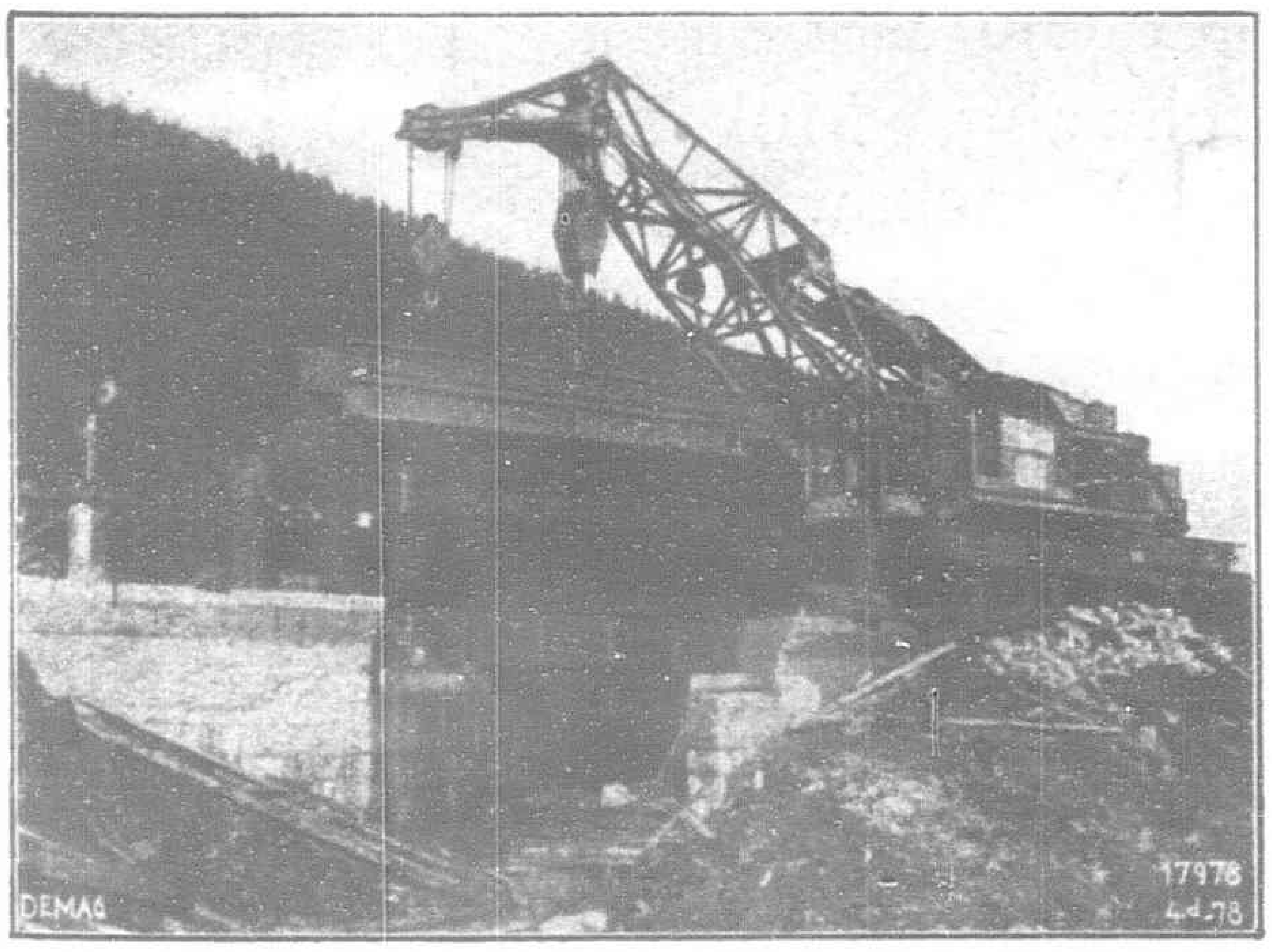
Highly efficient lifting appliances for Railway-workshops with special equipment for the hoisting and transporting of Locomotives, Tenders and Railway carriages.

The photo shows two 50-ton cranes for lifting engines co-operating to shift a locomotive and two 5-ton bracket cranes



We supply economically working locomotive coaling plants for small, medium and large quantities of coal to be handled daily. All plants are adapted to the existing local conditions.

The illustration shows a Demag coaling crane with built-in scales, travelling on walls of coal stack



As speciality we supply heavy derrick cranes for clearing work on the track, accidents, mounting bridges and for transporting heavy parts when constructing railways.

The adjoining illustration shows a Demag 25-ton railway crane lifting into position a bridge crossing a ditch

DEMAG AKTIENGESELLSCHAFT DUISBURG

We are Represented in:

China
Chien Hsin Engineering Co., Ltd.,
138 Kiangse Road, SHANGHAI
13 Shon An Street, TIENTSIN
Asiatic Building, HONGKONG
South of Tai Ping Str., CANTON

E. Bechler, 3rd Special District,
Corner of Hunan and Co-operation Road, HANKOW

China
J. Scheinhuette, Shang Pu, Sheng Hsuan Li 124, MUKDEN

Japan
P. Schmitz & Co., Eng. Office,
Nippon-Kaijo Building, OSAKA,
Tatemono Building, TOKYO

India
Maxwell, Dean & Murray, Ltd.,
100 Clive Street, CALCUTTA

Dutch East Indies
Kaumanns & Co., Bandoeng,
Grote Postweg 63.

Straits Settlements
Dr. Ernst Poll, SINGAPORE,
Raffles Hotel

Australia
Henry Simms & Co., Kembla Building, SYDNEY, N.S.W.

Philippine Islands
Philippine Eng. Co., Calle Raon P.O. Box 786, MANILA.

Cable Address: "MITSUI"
Head Office:
HONCHO, NIHONBASHI-KU, TOKIO

Capital Fully Paid: Yen. 100,000,000
Reserve Fund: Yen. 63,930,000
(May 1930)

MITSUI BUSSAN KAISHA, LTD.

(MITSUI & CO., LTD., IN EUROPE AND AMERICA)

General Exporters and Importers

Sawmill and Shipowners, and Shipbuilders

Established 1876

PRINCIPAL LINES OF BUSINESS:

Rice, Wheat, Beans, Seeds, Nuts, Flour, Sugar, Tea, Canned Goods, Marine Products, Vegetable and Fish Oil, Beer, Raw Silk, Silk Tissues, Rayon, Wool Top, Woollen Yarn, Jute, Hemp, Gunny Bags, Leather and Hides, Tobacco, Rubber, Shellac, Oil Cakes, Lumber, Timber, Coal, Mineral Oils, Iron and Steel, Copper, Tin, Lead, Other Metals, Cement, Matches, Pulp, Paper, Ginseng, Phosphate, Sulphate of Ammonia, Camphor, Alcohol, Dyestuff, Other Chemicals and Drugs, Fertilizers, Building Materials, Electric and Other Machineries and Tools, Railway Equipments, Automobiles and Aeroplanes, etc., etc.

Branch Offices and Representatives:

HOME—Otaru, Hakodate, Yokohama, Yokosuka, Nagoya, Shimizu, Niigata, Osaka, Tsuruga, Maizuru, Kobe, Tama, Okayama, Hiroshima, Kure, Moji, Wakamatsu, Karatsu, Miike, Nagasaki, Saseho, Taihoku, Keelung, Tainan, Takao, Keijo, Zinsen, Fusan, Kunsan, Seishin, Heijo.

ABROAD—Dairen, Antungsien, Newchwang, Mukden, Changchun, Harbin, Tientsin, Peiping, Chefoo, Shanghai, Wenchow, Tsingtau, Tsinan, Hankow, Amoy, Foochow, Canton, Hongkong, Saigon, Manila, Cebu, Singapore, Medan, Bangkok, Rangoon, Sourabaya, Semarang, Batavia, Bombay, Karachi, Calcutta, London, New York, San Francisco, Seattle, Toronto, Buenos Aires, Sydney, Melbourne.

Correspondents in European Continent
Berlin and Hamburg: Deutsche Bussan Aktiengesellschaft.
Lyon and Paris: Société Anonyme Francaise Bussan.

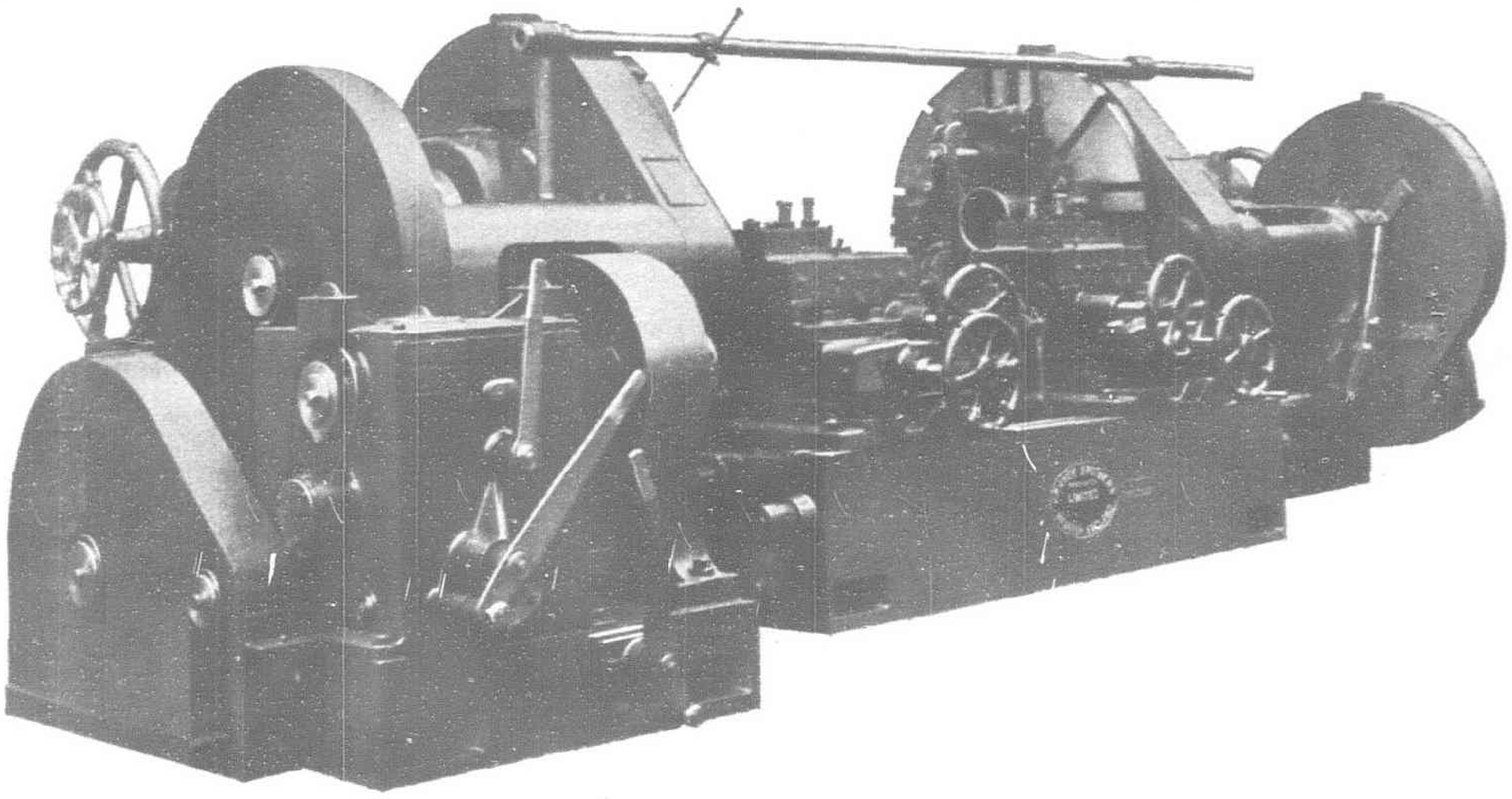
BOARD OF DIRECTORS:

Representative Directors:
MORINOSUKE MITSUI, Esq.
(President)
GENYEMON MITSUI, Esq.

Managing Directors:
Y. YASUKAWA, Esq.
K. NANJO, Esq.
M. KOBAYASHI, Esq.
T. KAWAMURA, Esq.

Directors:
Baron T. MITSUI.
K. FUKUI, Esq.
K. SEKO, Esq.
B. TANAKA, Esq.
T. HIRATA, Esq.
J. INOUYE, Esq.
S. TAJIMA, Esq.

Auditors:
S. TAKEMURA, Esq.
I. NAKAMARU, Esq.
T. KACHI, Esq.
T. MIKIMOTO, Esq.
B. MITSUI, Esq.



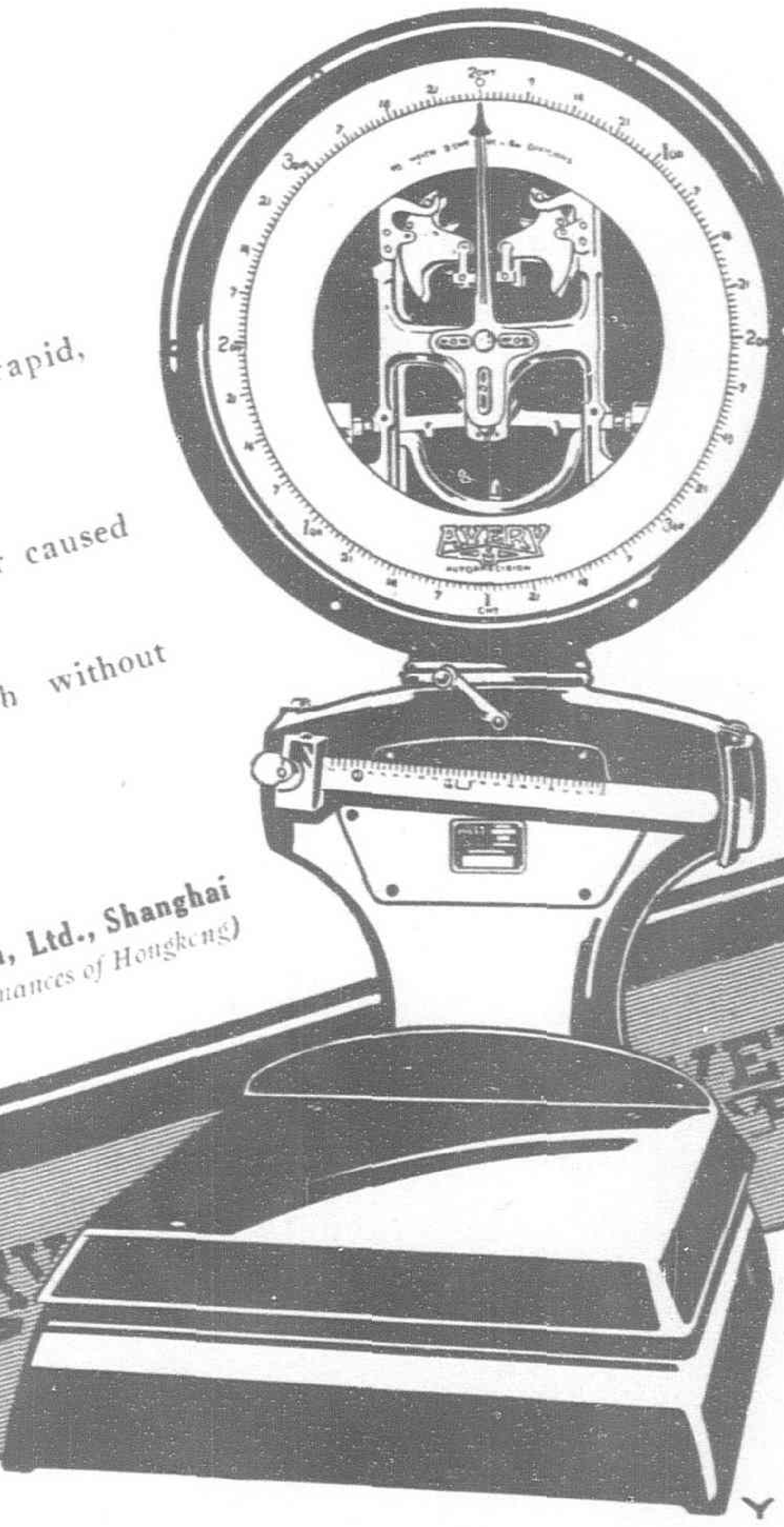
CRAVEN

WHEEL LATHES
for
Locomotive Carriage and
Wagon Wheels

Leading Features:—

Pneumatic Clamping of Headstocks
Push Button Control
Layout of Tooling to Obtain Maximum
Output. Covered Slides and Screws
Quick Acting Compensating Drivers
Both Headstocks Traverse to Reduce
Loading Times to a Minimum

CRAVEN BROTHERS (Manchester) LTD.
INCORPORATING
SIR W. G. ARMSTRONG, WHITWORTH & CO., LTD. (Machine Tool Dept.)
CRAVEN BROTHERS (MANCHESTER) LIMITED.
JOSHUA BUCKTON & CO., LIMITED.
THOMAS SHANKS & CO. (1928), LIMITED.
REDDISH STOCKPORT ENGLAND



AVERY AVERY AVERY

Modernize Your Weighing Methods.

The Avery A. 721 Self-Indicating Bench Scale, specially designed to give accurate, rapid, visible weighings to fine limits.
Indicator is dust-proof and moisture-proof.
Dial Graduations are widely spaced for clear reading.
Platform and **Levers** are arranged to prevent transmission of shock to the indicator caused by loading and unloading.
Tare Bar provided so that nett weight can be read on the chart.
Finish a red cellulose enamel which can be wiped down with a wet cloth without detrimental effect.
Capacities. 55-lb. to 260-lb.—25-kg. to 120-kg.
There is an *Avery Self-Indicating Scale* for every weighing purpose.

Agents for China:
The Jardine Engineering Corporation, Ltd., Shanghai
(Incorporated under the Companies' Ordinances of Hongkong)

W. & T. AVERY LTD.,
Soho Foundry, Birmingham, England.

AVERY AVERY AVERY

Y1903.

Cable Address
"IWASAKISAL-
TOKYO"

Codes Used :
Acme, Kendall,
Bentley's Complete
Phrase, Etc.

MITSUBISHI SHOJI KAISHA, LTD.

(MITSUBISHI TRADING CO., LTD.)

Importers and Exporters, Manufacturers, Commission Merchants, Brokers, Ship Owners.

Head Office :
MARUNOUCHI, TOKYO.

BRANCHES and AGENCIES :

Otaru, Yokohama, Nagoya, Osaka, Kobe, Kure, Moji, Taihoku, Takow, Seoul, Dairen, Tientsin, Tsingtao, Shanghai, Hankow, Hongkong, Singapore, Soerabaya, Sydney, London, New York, Seattle, San Francisco, Paris, Lyon, Berlin.

EXPORTING :

Coal, Copper, and all Other Descriptions of Metals and Ores, Cereals, Portland Cement, Oil, Paper, Fertilizer, Glass, Canned Goods, Silk Goods and General Oriental Products and Merchandise.

IMPORTING :

Iron, Steel, Other Metals and Ores, Building Materials, Railway Equipments, Aeroplanes, Machinery and Machine Tools of all Descriptions, Crude and Refined Petroleum, Fuel Oil, Fertilizer, Woollen Materials, Rice, Wheat, Tire and Rubber Goods, General Merchandise.

FLEET OWNED :

Two Motor Cargo-vessels	11,223 Tons Gross
Three Motor Oil-tankers	21,806 Tons Gross

General Cargo and Oil Tanker Services between Home Ports and Pacific Ports of U.S.A. and Canada.

MIIKE COAL

The Finest Steaming and Bunker Coals of the Far East are mined from the famed Miike, Tagawa, Yamano Sunakawa and Kawakami Collieries operated by the

MITSUI

MINING COMPANY, LTD.

Head Office :
No. 1 Surugacho, Nihonbashi-Ku,
TOKYO, JAPAN

Capital - - Yen 100,000,000

Annual Coal Output is equal to one-quarter of Total Japanese Mines.

LEAD, SILVER, GOLD, ZINC, COPPER, SPELTER, SULPHUR, COKE, IRON, CHEMICALS and DYES

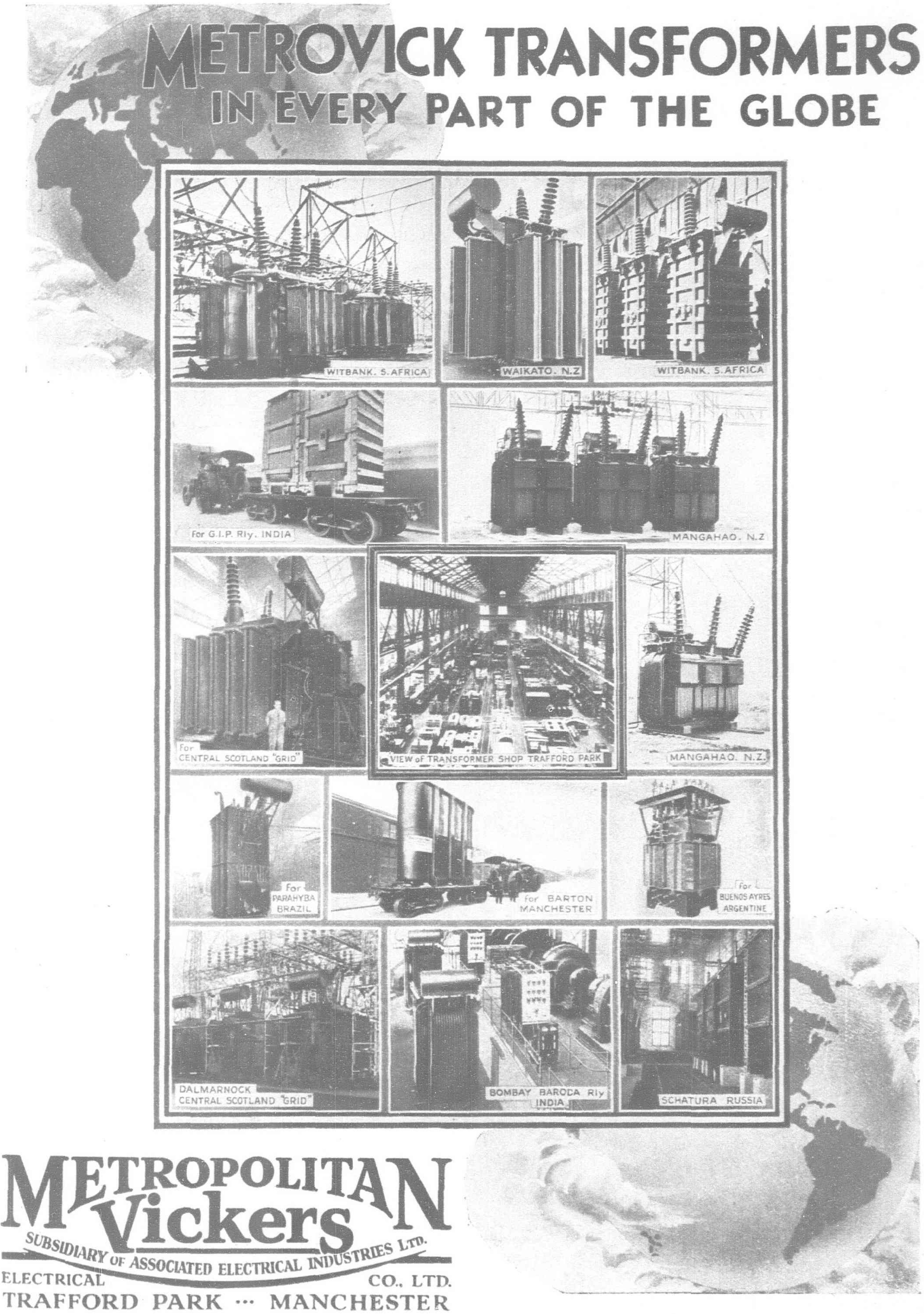
Are produced from the Company's, KAMIOKA, Lead, Silver and Zinc Mine; SANO, Copper and Zinc Mine; KUSHIKINO, Gold Mine; KONGO, Tungsten Mine; IWAONOBORI, Sulphur and Metal Mine; Zinc Plants, Coke, Dyestuffs and By-products Establishment in Miike.

Sole Agents for our Products :

MITSUI BUSSAN KAISHA, Ltd.

(MITSUI & Co., Ltd.)

Tokyo, London, New York, Shanghai, Hongkong, and other Principal Commercial Centres of the World



METROVICK TRANSFORMERS
IN EVERY PART OF THE GLOBE

METROPOLITAN Vickers
SUBSIDIARY OF ASSOCIATED ELECTRICAL INDUSTRIES LTD.
ELECTRICAL CO., LTD.
TRAFFORD PARK ··· MANCHESTER

A new light portable Crusher

Edgar Allen & Co., Ltd., have increased their range of Crushers and Granulators by the addition of a steel plate Frame Crusher, built up in sections. This machine has been specially designed by practical and experienced engineers, for ease of transportation. It is both light and strong and is supplied for both portable and fixed plants.

Edgar Allen & Co., Ltd.

Imperial Steel Works,

Sheffield.

Agents for India: MARTIN & CO., 12 Mission Row, Calcutta.
„ „ China: JARDINE ENGINEERING CORPORATION, LTD., P. O. Box No. 1238
8a, Yuen Ming Yuen Road, Shanghai.
„ „ Japan: HARADA & CO., 20 Itchabori-Kitadori, 6-Chome, Nishi-Ku, Osaka.

ROSE, DOWNS & THOMPSON (Far East), LTD.

29 CANTON ROAD, SHANGHAI

Telegraphic Address:
" ROSEDOWNS, SHANGHAI "

Works Established at Hull, England, 1777

Telephones:
13497 and 15530

Leading Specialists in the Manufacture of all Types of

OIL MILL MACHINERY

FOR THE TREATMENT OF ALL OIL-BEARING SEEDS AND NUTS AND FOR THE REFINING AND PURIFICATION OF ALL VEGETABLE OILS, TALLOWS AND WAXES.

On Most Modern Principles

HYDRAULIC MACHINERY
- Baling Presses for Cotton, Hides, Skins, Scrap Metals, Fibres, etc., etc.
- Presses for Gramophone Records.
- Hand-power, Belt Power and all Other Types of Presses.
- Hydraulic Pumps and Accumulators.

FISH MEAL AND FISH OIL MACHINERY: Complete Equipments on Continuous and Automatic System for Land and Sea-going Factories.

Sole Manufacturers of THE "KINGSTON" GRAB DREDGER AND EXCAVATOR
FOR ALL DREDGING PURPOSES—ASHORE AND AFLOAT

Steam Cargo and Fishing Winches. Briquette Machinery. Hydraulic Leathers.

Kailan Mining Administration

TIENTSIN, NORTH CHINA.

K.M.A. COKING COALS

On account of their Agglutinating Properties are used by the Largest Iron and Steel Manufacturers throughout Japan.

IF YOU MAKE COKE IN THE FAR EAST IT WILL PAY YOU TO USE K.M.A. COAL.

"K.M.A."
FIREBRICK
DOMINANT
IN THE WORLD
OF
HIGH REFRACTORIES

"K.M.A."
FIREBRICK
STAND FOR
EFFICIENCY
AND
ECONOMY

"K.M.A."
FIREBRICK
MAINTAINS ITS
SUPERIORITY
OVER ALL OTHER BRANDS

TRY THEM AND PROVE OUR CLAIMS.

The Average Plant Spends Considerable Money every year on what is termed "Ordinary Brickwork Troubles." Some of this, of course, is unavoidable, but do you ever stop to think that much of it could be saved by using **K.M.A.** REFRACTORY PRODUCTS

ENJOY the advantages...
BETTER... Profit by Them

ENJOY these advantages . . . yes, PROFIT by them when you ship your goods into American markets via the Pacific's nearest American port to you, SEATTLE. Profit by saving time . . . *and save the dollars that result !*

Seattle is nearer by several days to Oriental markets. The Port of Seattle offers seven ultra modern public terminals and exceptionally low handling costs to facilitate the transferring of shipments.

So many shippers have learned to "SHIP VIA SEATTLE" in the last few years that great public expenditures have been necessary to fulfill the demand for ship accommodations. Seventeen great passenger and freight lines to and from the Orient... six transcontinental railroads from Seattle. Yes, PROFIT BY THE ADVANTAGES SEATTLE OFFERS YOU . . . exceptional opportunities.

For full particulars write
Traffic Department

the PORT of SEATTLE

new 32-B

SHOVEL
DRAGLINE
CLAMSHELL
CRANE

1• YARD

BUCYRUS-ERIE COMPANY

South Milwaukee, Wis., U.S.A.

Sole Japanese Distributors: Mitsui and Company, Limited, Tokyo and Principal Cities of Japan.

● The newest of the new Bucyrus-Erie line of universal machines the 32-B, is destined to make new history —and new profits—wherever dirt is moved. The 32-B is rugged, nicely balanced, powerful, fast—combining more features which increase output and lower the costs of digging, than any other 1-yard machine. Send for full specifications.

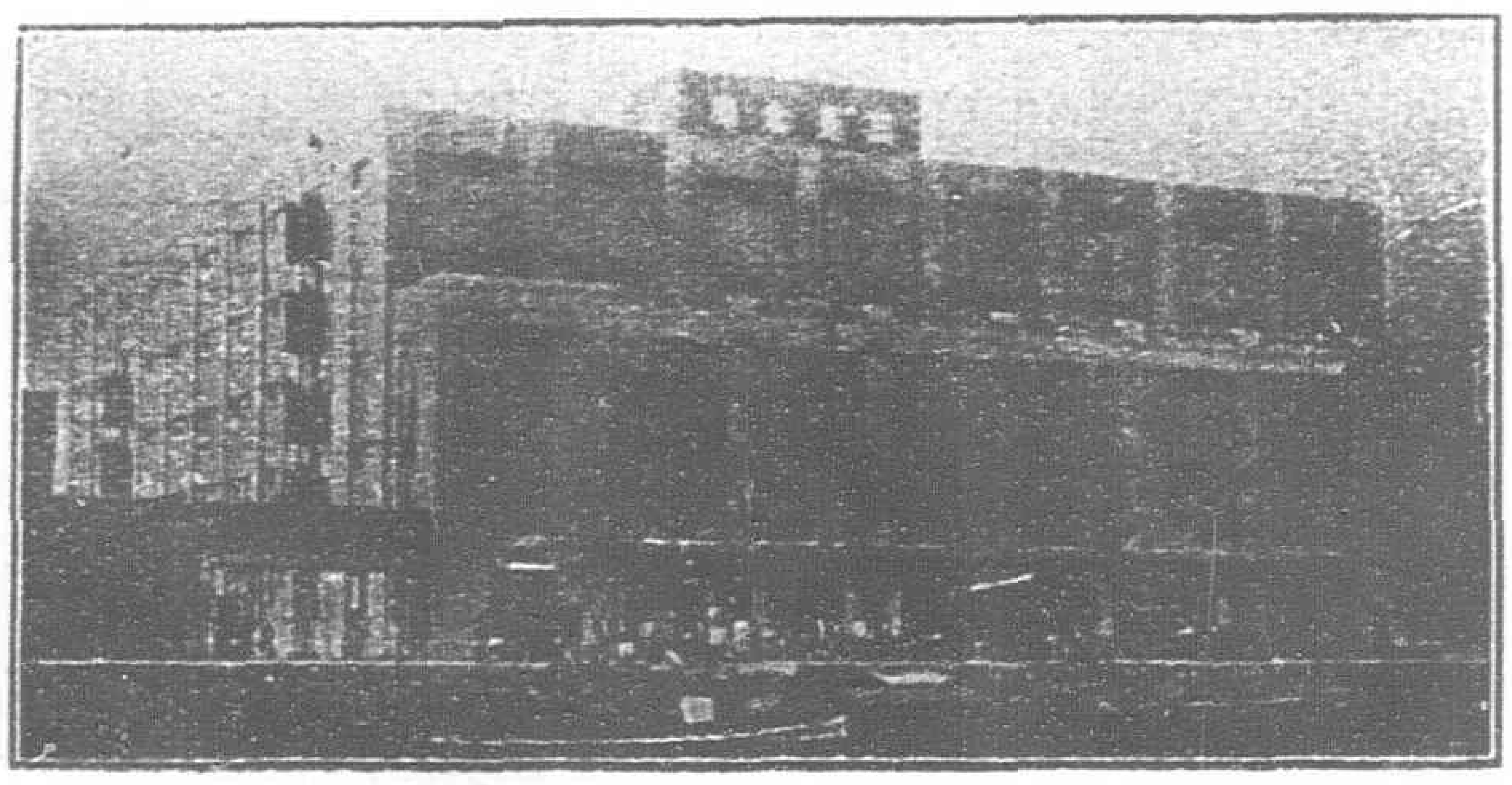
BUCYRUS ERIE

MITSUBISHI
WAREHOUSE CO., LD.
(MITSUBISHI SOKO KAISHA, LTD.)

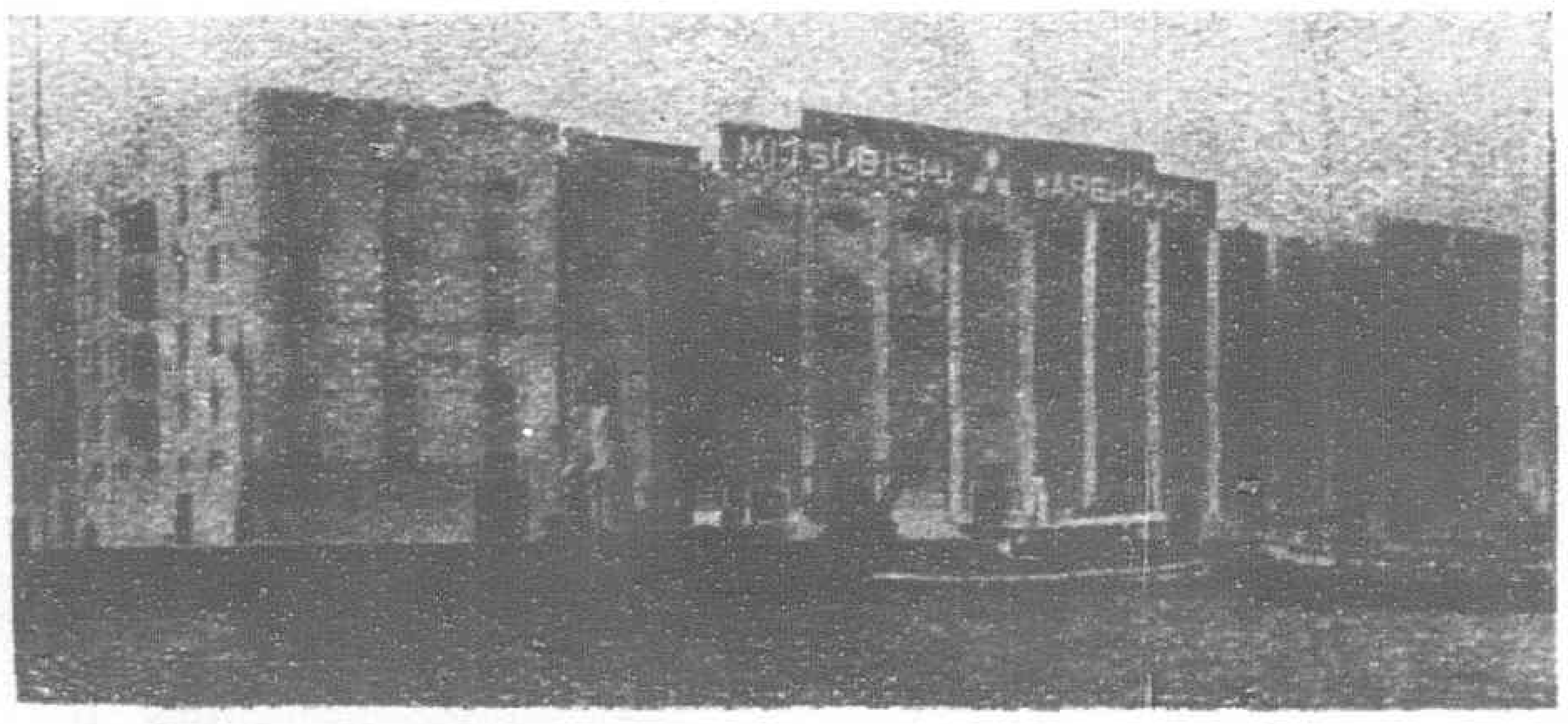
LANDING, SHIPPING AND FORWARDING AGENTS, STEVEDORES, CUSTOMS BROKERS & WAREHOUSEMEN

Capital Paid up- - Yen 10,000,000
Reserve - - - - - Yen 8,000,000

Managing Director: S. MITSUHASHI



WAREHOUSE AT OSAKA



THE WAREHOUSE AT SHINKO, KOBE

Head Office: MARUNOUCHI, TOKYO
Branches: TOKYO, YOKOHAMA, KOBE, OSAKA AND MOJI

Affiliated Companies:

KYODO UNYU KABUSHIKI KAISHA
(The Kyodo Express Co., Ltd., Yokohama, Tokyo)

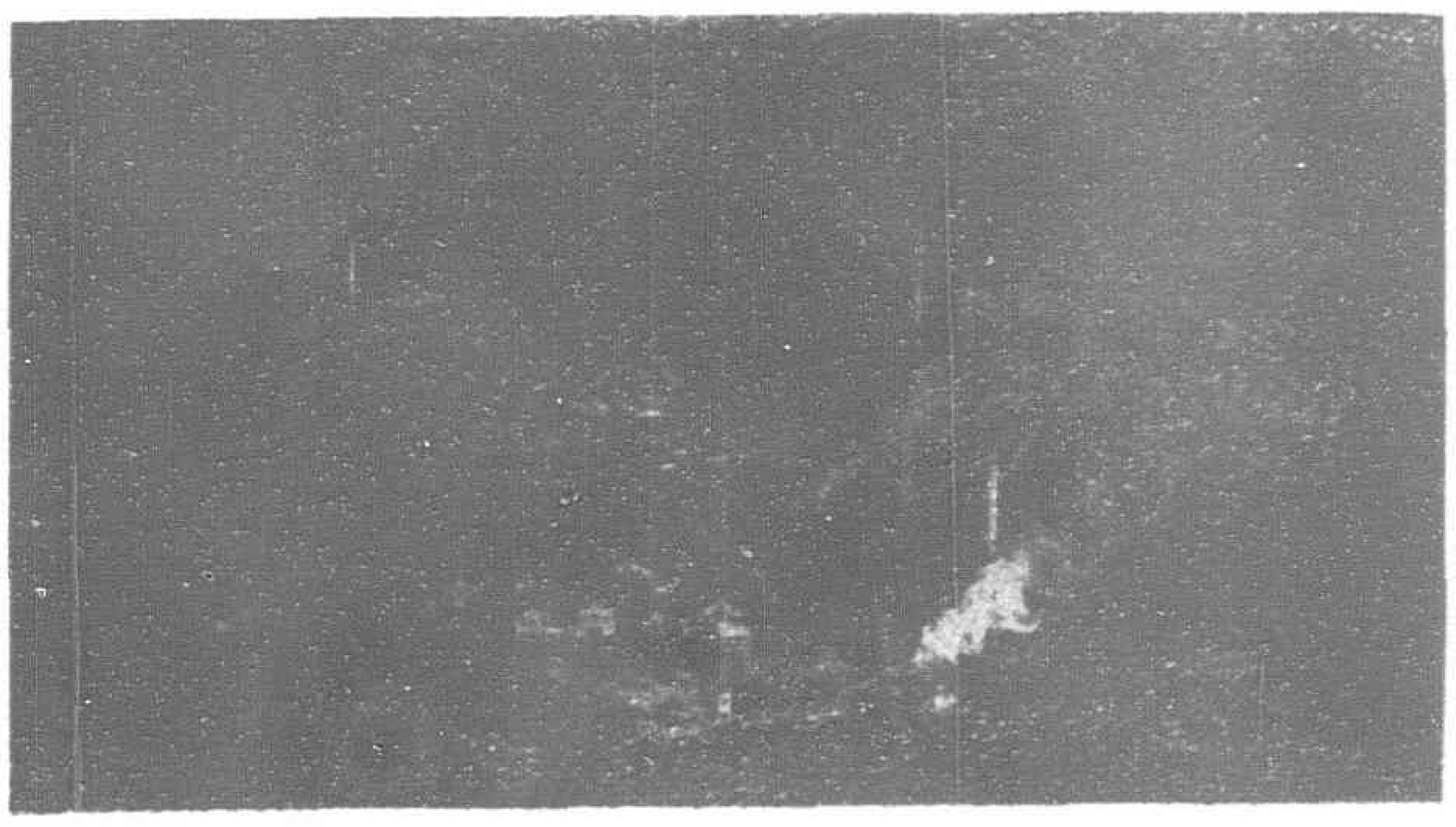
RIOKA SOKO KABUSHIKI KAISHA
(The Rioka Warehouse Co., Ltd., Shanghai)

Cable Address, all Branches: "SOKO"

Mitsubishi Iron and Steel Co.,
LIMITED

(MITSUBISHI SEITETSU KAISHA, LTD.)

Head Office: MARUNOUCHI, TOKYO
Capital (Paid-Up): YEN 25,000,000
Works: KENJIHO, CHOSEN (KOREA)



General View of the Kenjiho Iron and Steel Works

PRODUCTS:

PIG IRON—Basic and Foundry 150,000 tons
STEEL—Plates and Bars

BY-PRODUCTS:

Sulphate of Ammonia; Pitch; Naphthalene; Light Oil; Medium Oil; Heavy Oil; Motor Benzol; Solvent Naphtha

Sales Agents:

THE MITSUBISHI TRADING COMPANY, LIMITED, TOKYO

Branches and Agencies:

Yokohama, Nagoya, Handa, Shimizu, Osaka, Kobe, Okayama, Onomichi, Tokushima, Moji, Saseho, Yahata, Nagasaki, Otaru, Kure, Keijo, Fusan, Niigata, Aomori, Wakamatsu, Sendai, Keelung, Taihoku, Takao, Dairen, Harbin, Tientsin, Chingwangtao, Tsingtao, Shanghai, Hankow, Hongkong, Singapore, Soerabaya, Sidney, London, New York, Seattle, San Francisco, Vancouver, Paris, Lyon, Berlin.

We are exhibiting at the

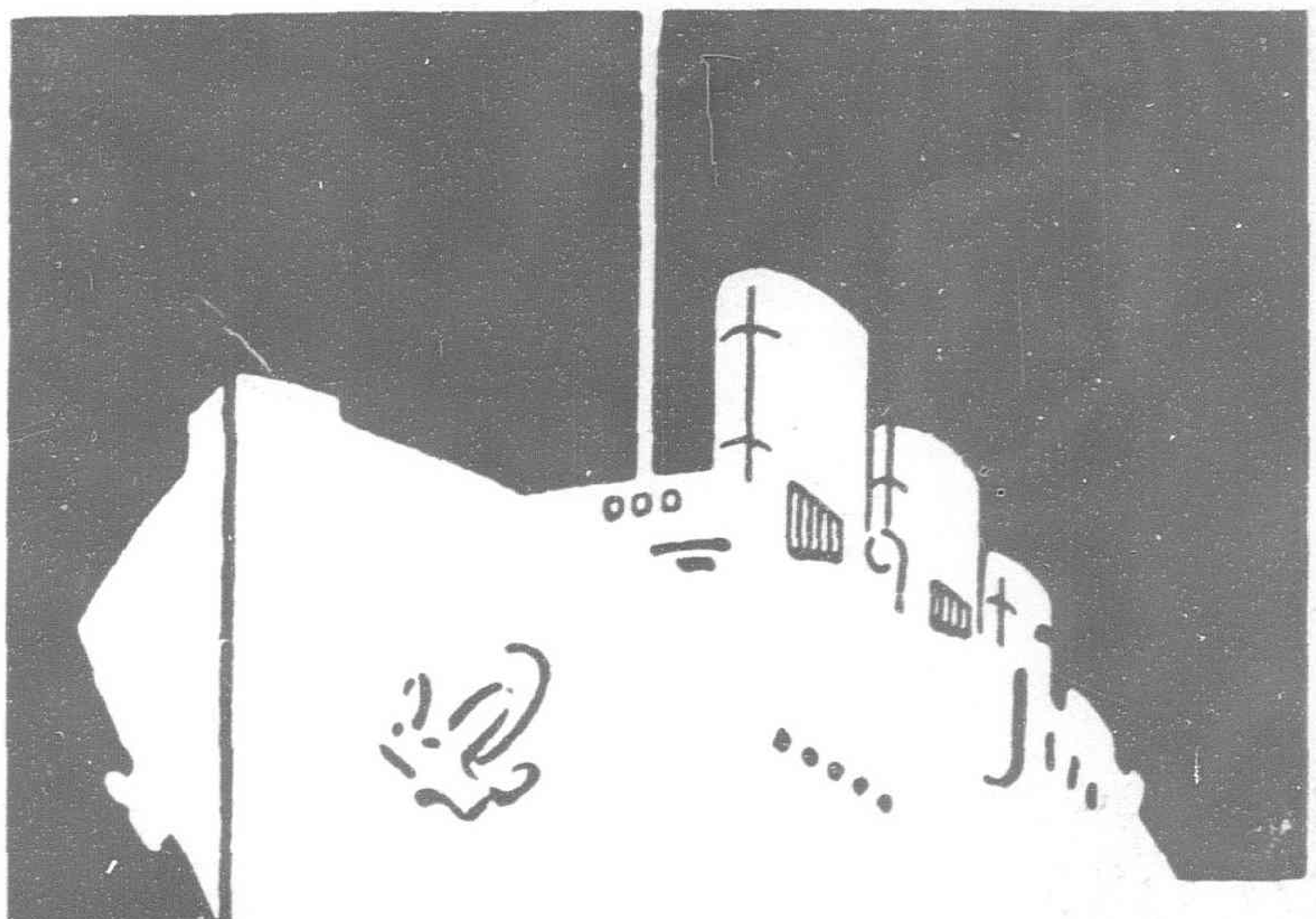
BRITISH INDUSTRIES FAIR, Birmingham

February 22 to March 4, 1932

A. REYROLLE & CO LTD

HEAD OFFICE AND WORKS

HEBBURN-ON-TYNE ENGLAND



The

Cruise Triumphant!

●

Never before such a record ship as the "Empress of Britain" on a round-the-world cruise . . . a 5-day-to-Europe, 42,500 gross-ton, Class AA liner. She sets a new standard in modern travel. She makes an entirely new delight of cruising. Her progress through the ports of the world will be a port-to-port gala, a perpetual festivity. To arrive on the "Empress of Britain" will be to receive the accolade of the travel world, and the admiration of the whole harbor.

Never before such private-house luxury for round-the-world passengers. To size and speed, the "Empress" adds more space per individual passenger than any other ship afloat. You live in your private apartment, with sun and air, controlled heat and ventilation, smart town-house furniture and decorations, electric conveniences. Whether you choose a single perfectly-appointed apartment with bath, or a 5-room royal suite, you will live and be served smartly in all.

Never before such a happy combination of country club and social-season-in-town amusements. For day, an entire Sports Deck with full size tennis court, a squash-racquets court, a racing swimming pool. For night an entire Lounge Deck . . . ball-room, stage, screen, and a smart lounge-bar . . . you dance your way from port to port. See the deck plans, study the itinerary.

"EMPRESS OF BRITAIN"

WORLD CRUISE

From Shanghai, February 16th

for Chinwangtao, Peiping (Great Wall), Beppu, Inland Sea, Kobe, Nara, Kyoto, Yokohama, Tokyo, Kamakura, Honolulu (Waikiki Beach), Hilo (Kilauea Volcano), San Francisco, San Pedro, Los Angeles, Balboa, (Ancon), Panama City, Old Panama, Panama Canal, Colon, Christobal, Havana, New York thence Cherbourg and Southampton.

For those who desire to make direct connection at Yokohama, March 6th, we solicit their enquiries for suggestions.

●

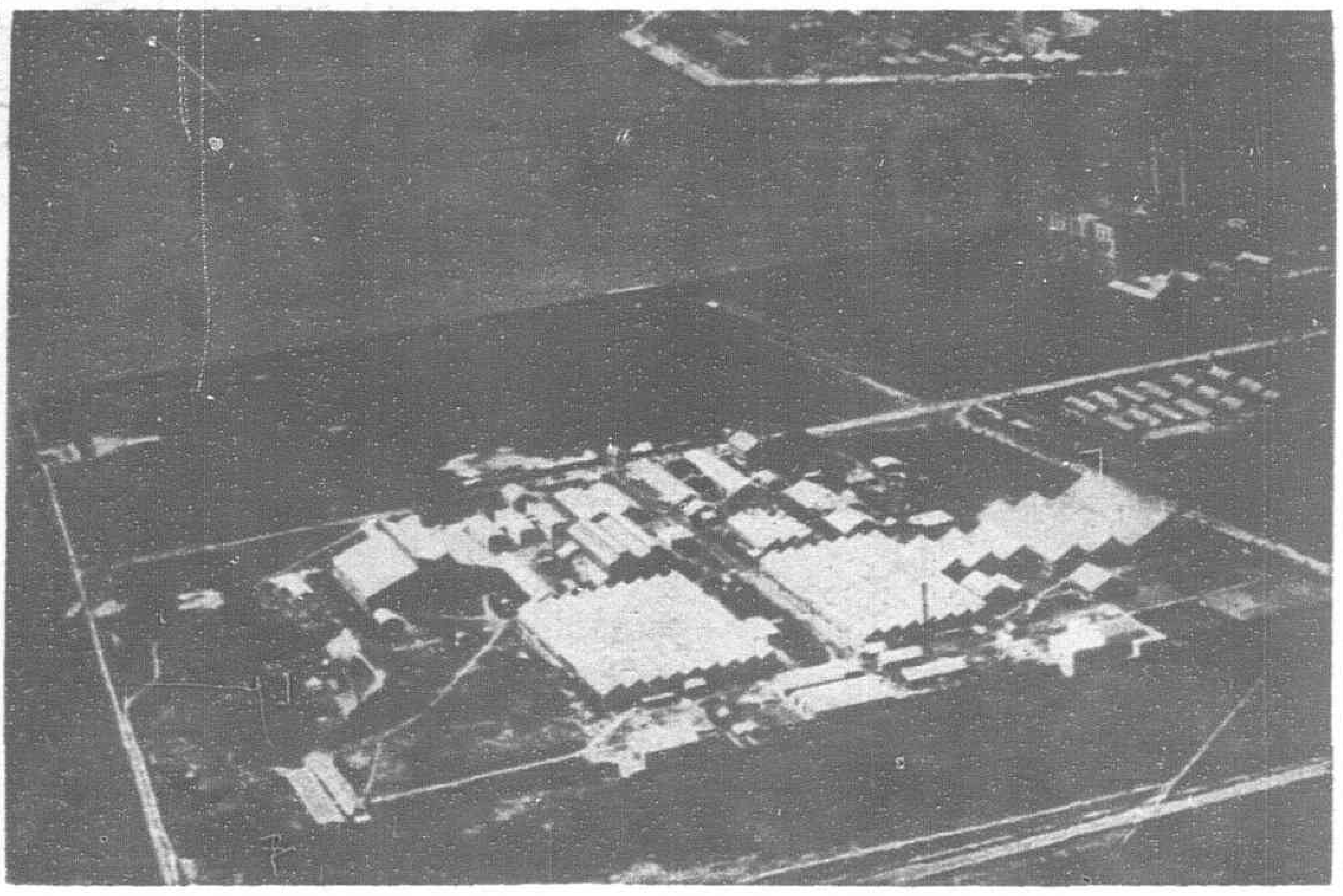
Information, booklets with itineraries and rates, also reservations made at:
Union Bldg. No. 4 The Bund — Telephone 65581

CANADIAN PACIFIC

World's Greatest Travel System

MITSUBISHI AIRCRAFT CO., LTD.
(MITSUBISHI KOKUKI KABUSHIKI KAISHA)
Manufacturers of
Aircrafts, Aero-Engines, Aeronautical Arms, Automobiles, etc.

Head Office:—Marunouchi, Tokyo
Nagoya Works:—Oecho Minami-ku, Nagoya
Tokyo Works:—Hinodecho Shiba-ku, Tokyo



Bird's-eye view of the Nagoya Works

Mitsubishi Mining Co., Ltd.

Producers and Sellers of Coal, Metals and other Minerals

Capital Y. 100,000,000

Head Office: MARUNOUCHI, TOKYO

Cable Address: "IWASAKIMIN TOKYO"

Products:

Coal, Coke, Gold, Silver, Electro. Copper, Electro. Tin, Electro. Lead, Tungsten, etc.

Branches and Representatives:

Tokyo, Yokohama, Nagasaki, Karatsu, Wakamatsu, Moji, Otaru, Muroran, Hakodate, and all the Branches of Mitsubishi Trading Co., Ltd.

NIPPON MENKWA KABUSHIKI KAISHA
(JAPAN COTTON TRADING CO., LTD.)
ESTABLISHED 1892

COTTON, COTTON YARN, PIECE-GOODS, RAW SILK, WOOL, JUTE, RICE AND GENERAL COMMISSION MERCHANTS.

Capital Subscribed - - -	Yen 50,000,000.00
Capital Paid-up - - -	Yen 26,000,000.00
Reserves & Undivided Profit -	Yen 22,860,000.00

Head Office:

No. 10 Nichome, Nakanoshima, Kitaku, Osaka, Japan

Branches:

Semba (Osaka), Tokio, Yokohama, Nagoya, Dairen, Shanghai, Hankow, Tientsin, Tsingtau, Hongkong, Bombay, Calcutta, Rangoon, Soerabaja and Sydney,

Agencies & Correspondents:

Kobe, Moji, Seoul, Mokpo, Yingkow, Mukden, Changchun, Tsinan, Chengchow, Canton, Saigon, Karachi, Semarang, Batavia, Mombasa, Jinja, Dares Salaam, Mikese, Namaganda, Alexandria, London, Liverpool, Bremen, Hamburg, Milan, New York, Dallas, Houston, New Orleans and Buenos Aires.

TOYO MENKA KAISHA,
LIMITED
(The Oriental Cotton Trading Co., Ltd.)
HEAD OFFICE:
Koraibashi San-chome, Higashi-ku,
OSAKA, JAPAN

Capital - - - - - - - Y.25,000,000

Cotton Merchants, Importers and Exporters

Cotton, Cotton Yarn and Cotton Goods

BRANCHES AND AGENCIES:

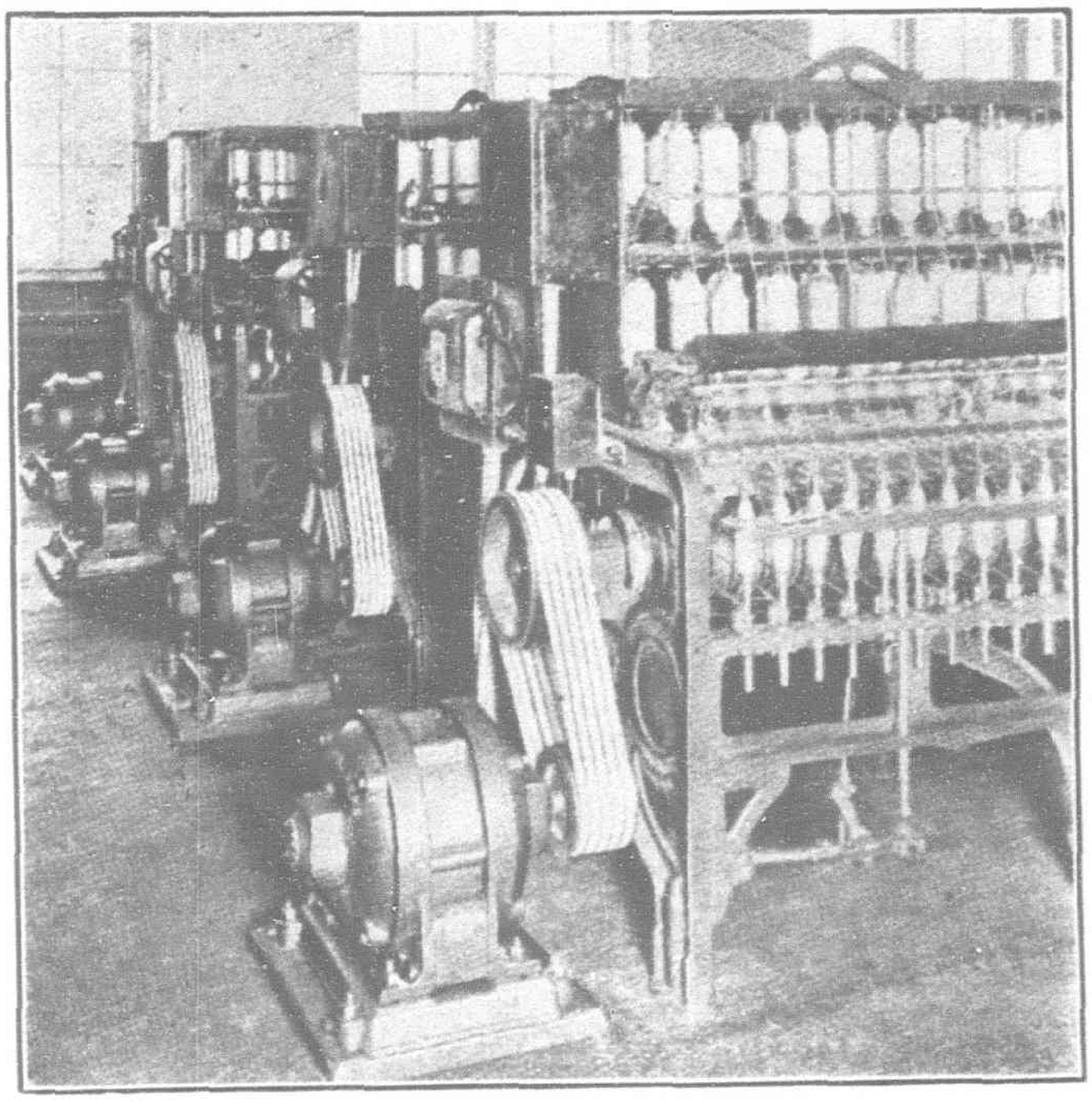
Japan and Korea:	Tokyo, Nagoya, Kobe, Moji, Keijo, Moppo
China:	Dairen, Newchwang, Mukden, Changchun, Tieh-ling, Harbin, Tsingtau, Tsinan-fu, Tientsin, Shanghai, Te-chow, Hankow, Hongkong
Java:	Sourabaya, Semarang
India:	Bombay, Karachi, Calcutta
France:	Havre

AMERICAN TRADING COMPANY

ENGINEERS AND CONTRACTORS
IMPORTERS — EXPORTERS

Briefly, the advantages of the Texrope Drive are :—

1. Short centers, taking up practically no space of value.
2. Silence, always.
3. Positive and slipless.
4. Trouble proof, requiring no tinkering or adjustment. Upkeep and maintenance consist only of replacement of belts when worn out, which is both infrequent and inexpensive.
5. Cleanliness, no oil or grease to leak and collect dirt.
6. Moisture, dust and dirt do not affect it.
7. Does not transmit vibration.
8. Smooth starting, acceleration and running.
9. Shock absorbing.
10. No lost motion, yet no imposed tension to increase bearing pressures. The belts just fit, with neither stretch or slack.
11. A fixed and exact speed ratio.
12. Simplicity. A Texrope Drive consists of two sheaves and a number of belts, and nothing else.
13. High efficiency and economy.
14. Safety.



Allis-Chalmers Texrope Drives

Agents in China for :—

Allis-Chalmers Manufacturing Co.—Motors, Generators, Pumps, Mining, Saw Mill and Flour Mill Machinery, Engines, Turbines, Crushing and Cement Machinery, etc.
Armco International Corp.—Pure Ingot Iron Products.
Baker Perkins, Ltd.—Confectionery and Biscuit Machinery.
Arthur Colton and Company.—Pharmaceutical Machinery for all purposes.
Continental-Diamond Fiber Co.—Vulcanized Fiber and Fibre Sheets, Rods, Tubes.
The Dyer Company.—Complete Sugar Plants.
Forgrove Machinery Co., Ltd.—Wrapping Machines.
Hanson-van Winkle-Munning Co.—Polishing and Plating Equipment and Supplies.
Ingersoll-Rand Co.—Ammonia Compressors.
Jewell Export Filter Co.—Mechanical and Gravity Water Filters.
E. D. Jones, Bagley and Sewall and Associated Companies.—Complete Paper and Strawboard Mills.
Edw. R. Ladew Co.—Leather Belting.
Oliver United Filters, Inc.—Filtration Equipment.
Package Machinery Company.—Wrapping Machinery.
Paradon Engineering Co.—Water Purification Equipment.
Savy Jeanjean & Cie.—Confectionery Machinery.
The A. E. Staley Manufacturing Co.—Starch and Glucose.
B. F. Sturtevant Co.—Economizers, Fans, Ventilators, etc.
Swiss Silk Bolting Cloth Mfg. Co.—(Schindler's).
W. S. Tyler Co.—Woven Wire Screening.
Werner Pfleiderer Co.—Bread and Bakery Machinery.
York Safe and Lock Co.—Vaults, Safes, etc.

AMERICAN TRADING COMPANY
OF THE FAR EAST, INC.

3 CANTON ROAD TEL. 15079 (3 lines) SHANGHAI

AMERICAN TRADING CO. OF JAPAN, LTD., TOKYO—KOBE

BUILDING:

SHANGHAI'S PARAMOUNT INTEREST

Refer to the Latest Edition of the

China Architects and Builders Compendium

The latest available technical and general data on all branches of building, architecture and property are here presented in a clear, concise and practical fashion. The phenomenal increase in all classes of building in Shanghai, combined with enhanced land values, makes an authoritative reference book of this nature indispensable, not only to constructional and civil engineers, contractors, builders and architects, but to property owners as well.

Price Mex. $5

The Publisher, North-China Daily News & Herald, Ltd., Shanghai

"North-China Daily News"

and

"North-China Sunday News" (with Magazine Supplement)

A morning daily printed in English, published in Shanghai, and circulating throughout the larger cities and Treaty Ports of China. The largest newspaper in the Far East, both in size and circulation, averaging 22 pages daily, exclusive of its Sunday Supplement. Official medium for the publication of all Municipal, Legal and Consular notices.

Subscription: Mex. $24 per annum

"North-China Herald"

A weekly newspaper of 36 pages, published every Wednesday, containing all the Far Eastern news in the "North-China Daily News." It is the newspaper of the Consular, Customs, and Postal Official, and the resident in the interior of China. Its audited net circulation is published periodically. Established in 1850.

Subscription: Mex. $16 per annum

For sample copies, advertising rates, and general information about China, address

The Publisher, North-China Daily News & Herald, Ltd., Shanghai

STANDARD OIL COMPANY OF NEW YORK

26 Broadway New York

The Mark of Quality

SOCONY PRODUCTS

Illuminating Oils

Gasoline and Motor Oils

Asphaltums, Binders and Road Oils

Lubricating Oils and Greases

Fuel Oil

Paraffine Wax and Candles

Lamps, Stoves and Heaters

BRANCH OFFICES IN THE PRINCIPAL CITIES OF

Japan
China
Indo-China
Siam
India
Philippine Islands
Straits Settlements
Netherlands India
South Africa
Australasia
Turkey
Syria
Bulgaria
Greece
Jugoslavia

BUILDING SUPPLIES

We Represent Manufacturers of

GLASS Figured rolled, wired, Calorex, etc., etc.

"GYPROC" Gypsum wall board for all purposes.

"INSULEX" Gypsum Insulating powder for insulation against heat and cold

HARDWARE Locks and door furniture in all qualities.

"TEN/TEST" Insulating board for insulation against heat, cold, sound and vibration.

TILES White glazed, coloured, red quarries, mosaics, etc.

ROLLER SHUTTERS For garages, depots, sheds, docks, etc.

STRONG ROOM DOORS

SANITARY WARE Vitromant, Duramant and Adamant Ware

STEEL WINDOWS, ETC.

ARNHOLD
& COMPANY LIMITED

(Incorporated under Hongkong Ordinances)

SASSOON HOUSE
Shanghai.

Branches
Throughout China

TRADE MARK

Pure Cane Sugar

RAW AND REFINED

FUJI BRAND CUBE AND GRANULATED

ALCOHOL

ESTABLISHED 1900

CAPITAL . . . . Yen 63,000,000

THIRTEEN RAW SUGAR MILLS IN FORMOSA

TWO REFINERIES ON MAINLAND

TAIWAN SEITO KABUSHIKI KAISHA

(Formosa Sugar Manufacturing Co., Ltd.)

HEAD OFFICE
Heito, Formosa, Japan.

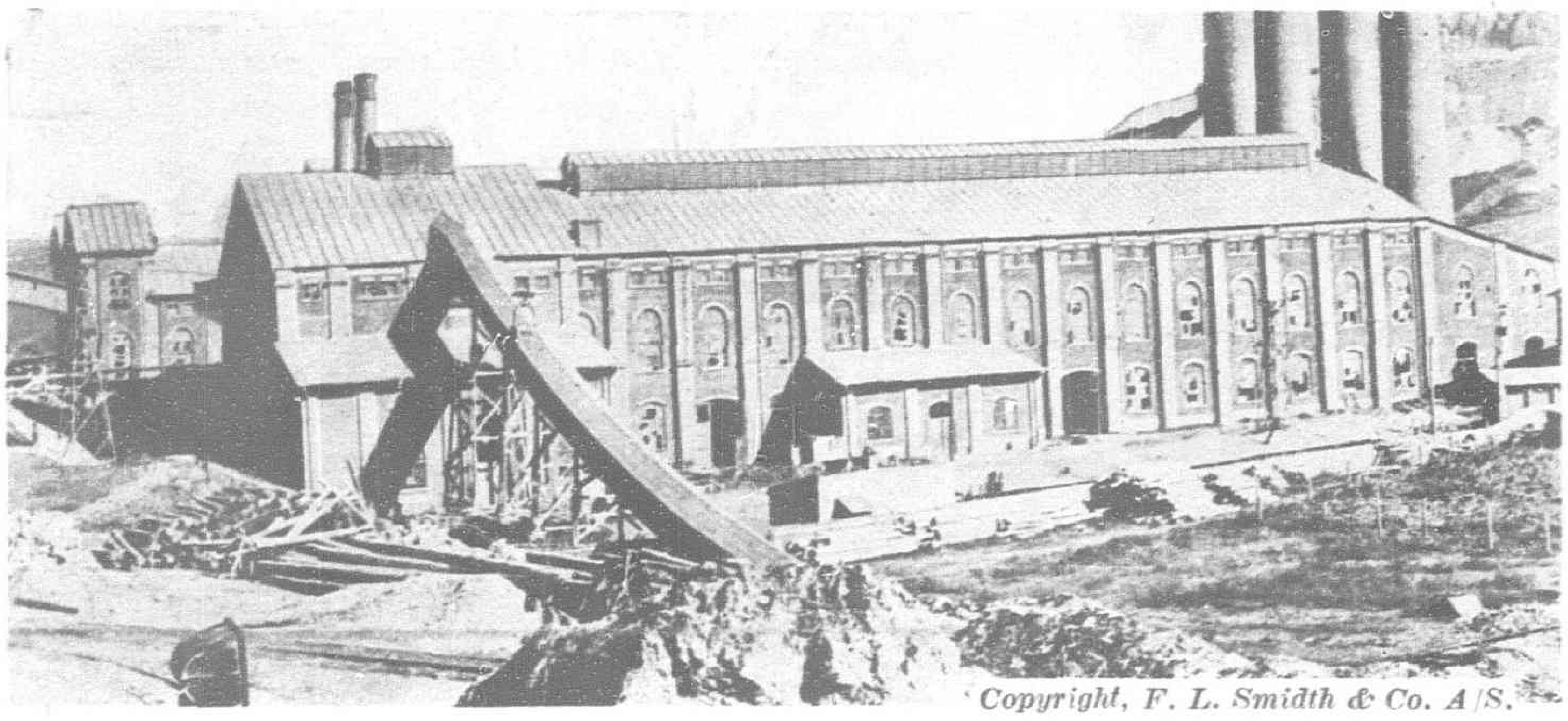
TOKYO OFFICE
Yuraku Building, Marunouchi
TOKYO, JAPAN.

F. L. SMIDTH & CO. A/S

Head Office: 33 Vestergade, Copenhagen, Denmark
SHANGHAI: Hongkong & Shanghai Bank Bldg., 1 Foochow Rd. *PEIPING:* 23 Hsi Tsung Pu Hutung
Telegraphic Address: "Folasmidth."

LONDON
SYDNEY
PARIS

TURIN
NEW YORK
TOKYO



Copyright, F. L. Smidth & Co. A/S.

Cement Works in Hungary, Supplied with F. L. Smidth & Co. A/S, Machinery

Designs and Complete Equipment for

PORTLAND CEMENT WORKS

Grinding Machinery for all Purposes. Rotary Kilns for Burning Cement, Lime and Magnesite and for Agglomeration of Iron Ore.

More than 470 Rotary Kilns, with a total yearly output of 126,000,000 Barrels, have been supplied and more than 5,000 Grinding Plants equipped with our Machinery

---

BABCOCK & WILCOX, LIMITED

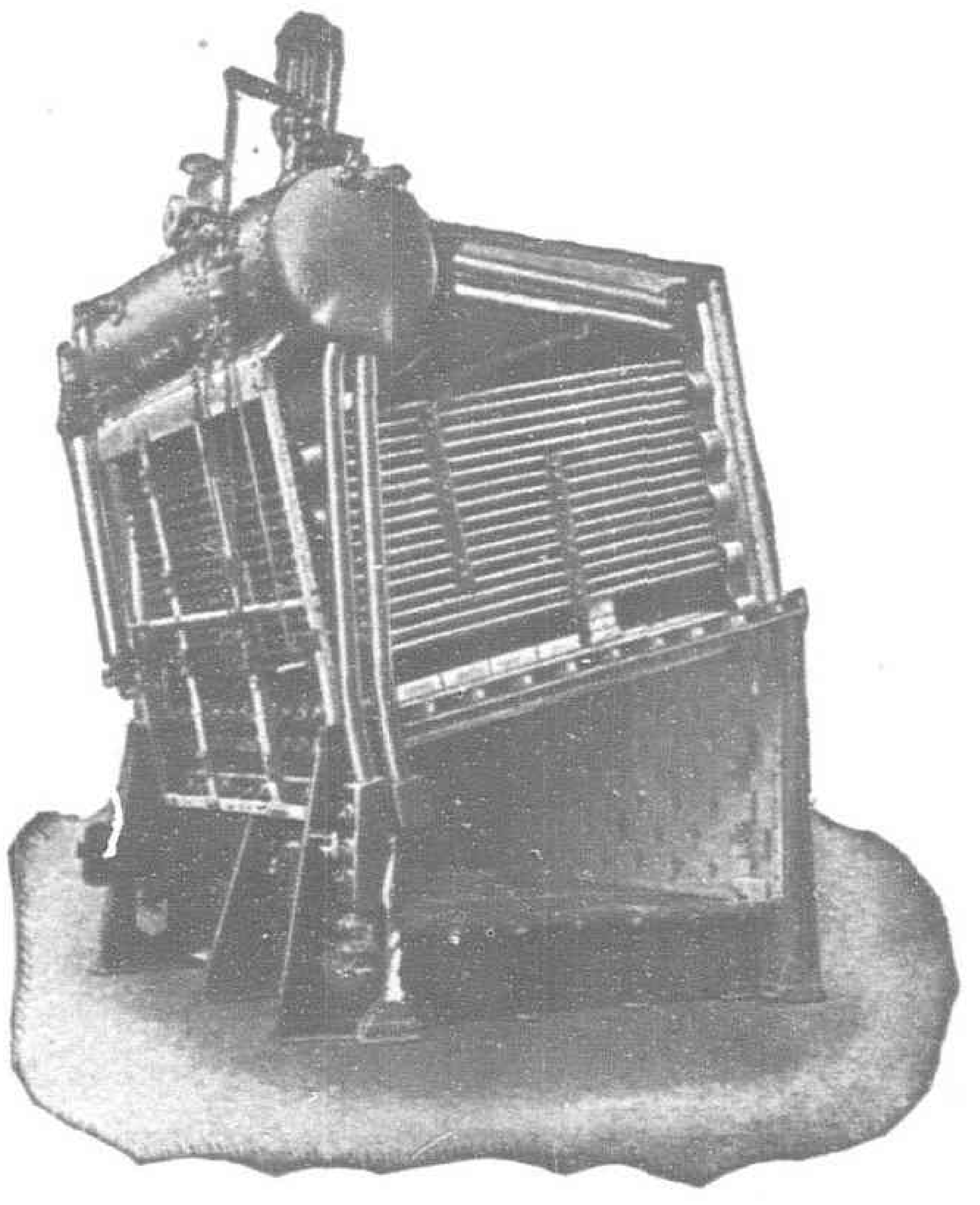
PATENT WATER-TUBE STEAM BOILERS

SUITABLE FOR ALL INDUSTRIES, AND FOR BURNING ANY KIND OF FUEL

THE
BABCOCK & WILCOX
PATENT
MARINE-TYPE
BOILER

as used in Battleships and Cruisers of the British, American, Danish, Italian, Spanish, Brazilian, and Argentine Navies, and in Vessels of all Classes of the Mercantile Marine.

BABCOCK & WILCOX also Supply "Express" Type Light-weight Boilers for Destroyers, Torpedo Boats, Pinnaces. etc.



Babcock & Wilcox Marine Boiler

MANUFACTURERS OF

SUPERHEATERS
ECONOMISERS
MECHANICAL STOKERS
FEED-WATER HEATERS
STEAM PIPING
HIGH PRESSURE VALVES
DIAMOND SOOT BLOWERS
LIQUID FUEL EQUIPMENT
WATER SOFTENERS AND PURIFIERS
STEEL CHIMNEYS
PULVERIZED COAL PLANT
COAL CONVEYORS
ASH HANDLING PLANT
STRUCTURAL STEEL WORK
ELECTRIC & OIL-DRIVEN CRANES

SUPPLIERS OF:

COMPLETE STEAM PIPING PLANTS AND ALL BOILER HOUSE ACCESSORIES

Head Office for China: 1 THE BUND, SHANGHAI
Sole Licensee for Japan: TOYO BABCOCK KABUSHIKI KAISHA
Head Office No. 1 ISOGOMACHI, ISOGO-KU, YOKOHAMA

JAPANESE

TEXTILES FOR EXPORT

Kanegafuchi Spinning Co., Ltd.

Head Office: MUKOJIMA, TOKYO, JAPAN
Business Office: HYOGO, KOBE

SILK
COTTON YARNS
NOILS, etc.

Reelers and Throwsters of Raw Silk; Manufacturers of all classes of Pure Silks; Spinners of all kinds of Cotton and Spun Silk Yarns; Manufacturers of all kinds of Cotton Cloth and Spun Silk Fabrics.

Printing, Dyeing, Bleaching and Finishing Works.

For Home and Foreign Markets.

OUR EXPORT DEPARTMENT
IS REPRESENTED IN ALL THE IMPORTANT COMMERCIAL CENTERS OF THE WORLD AND CAN FURNISH PROMPTLY FULL INFORMATION AND QUOTATIONS REGARDING THE LARGE VARIETY OF TEXTILES MADE IN OUR MILLS

Fuji Gassed Spinning Company, Ltd.

(Fuji Gasu Boseki Kabushiki Kaisha)

Capital: Yen 38,000,000

STANDARD PRINTED
and
DYED COTTON and
SILK FABRICS

SHIRTINGS
PRINTS
DAMASKS
PONGEES
CREPES
SHEETINGS
CRETONNES
TOWELLING
ETC. ETC.
BROCADES
SILKS
DRILLS
FLANNELETTES
CREPES
SATINS

Head Office:
GOCHOME, OSHIMA-MACHI, NEAR TOKYO
Cable Address "FUHO"
Business Office:
SAKAMOTOCHO, NIHONBASHI-KU, TOKYO

JAPANESE

TEXTILES FOR EXPORT

DAI NIPPON BOSEKI KAISHA

Established 1889.

Capital	**Y. 50,000,000**
Reserve & Brought For'd.	**Y. 46,017,000**

MANUFACTURERS

of

All Sorts of Cotton Yarns and Cloths, Raw Silks and Spun Silks

Head Office

3-chome, Bingo-machi, Higashi-ku,
OSAKA.

President

Dr. K. KIKUCHI.

Factories:

Fifteen Mills at Home and
Two Mills in China

Number of Spindles:	Cotton Yarn	993,700
	Silk Yarn	47,500
Number of Weaving Machines:		9,100

NAIGAI WATA KABUSHIKI KAISHA

Established 1887.

Capital	**Y. 16,000,000**
Capital Paid-Up	**Y. 13,250,000**
Reserve	**Y. 14,343,206.31**

MANUFACTURERS

OF

COTTON YARN & CLOTH

Head Office

Dojima-kitamachi, Kitaku, OSAKA.

Factories in China:

Shanghai, Tsingtao, Chin-chou.

Number of Spindles:	Spinning	398,176
	Twisting	32,340
Number of Weaving Machines:		2,500

JAPANESE

TEXTILES FOR EXPORT

TOYO BOSEKI KAISHA

Manufacturers of

COTTON YARN; SHEETINGS, SHIRTINGS,
T-CLOTHS, DRILLS, JEANS, SATINS;
WHITE, DYED and PRINTED; SPUN SILK.

Head Office: DOJIMA HAMAORI, OSAKA.

President: FUSAJIRO ABE

OSAKA GODO COTTON SPINNING CO.

ESTABLISHED 1900

Capital (Full paid up)	**Yen 18,750,000**
Reserve and Brought Forward.	**Yen 23,095,610**

Manufacturers of

COTTON YARNS, GREY and WHITE SHIRTINGS, JEANS
and OTHER COTTON CLOTHS.

Head Office: 2-chome, Dojima-hamadori, Kita-ku, Osaka.
President: H. AKIYAMA.

FACTORIES: Nine Mills in Japan.

Number of Spindles:	**Spinning**	**436,184**
	Twisting	**63,976**
Number of Weaving Machines		**4,576**

"*Regulated*"
indoor air
with YORK EQUIPMENT

In factory, mill, theatre, restaurant and store...there is a growing need for "regulated" indoor air ...regulated as to temperature, humidity and purity.

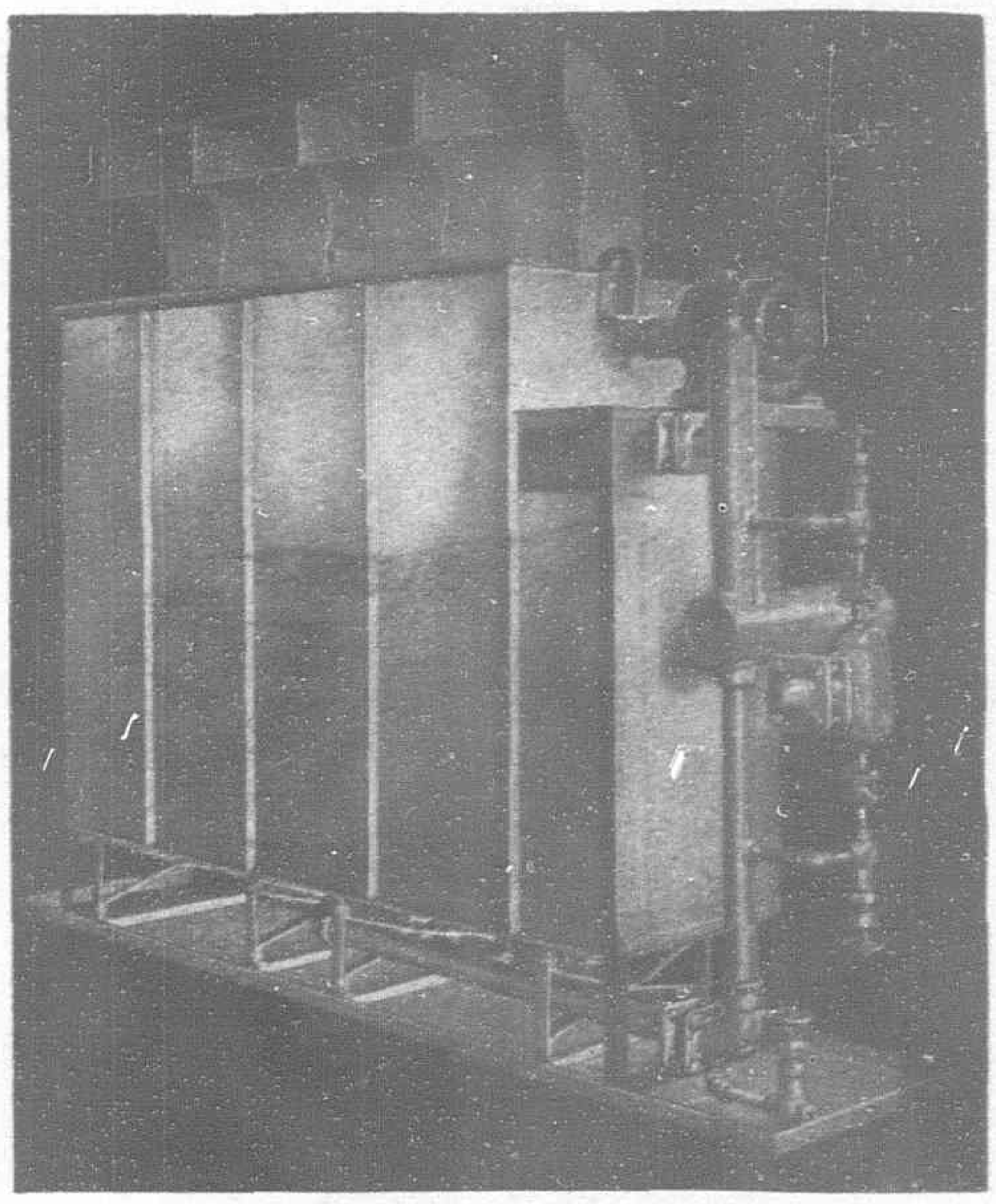
This conditioning of indoor air is inseparable from refrigeration.

York, as pioneer in refrigeration, is pioneer in designing and building Air Conditioning Equipment.

York Air Conditioning Equipment is built in a full range of sizes and types. It can fulfill all industrial and commercial requirements, whether large or small, whether they include air cooling, washing, humidifying or dehumidifying...or all four.

Send for complete information on York Air Conditioning Equipment; also Refrigerating and Ice Plant Machinery.

YORK-SHIPLEY, INCORPORATED, 21 JINKEE ROAD, SHANGHAI, CHINA



York Coil Type Air Conditioner

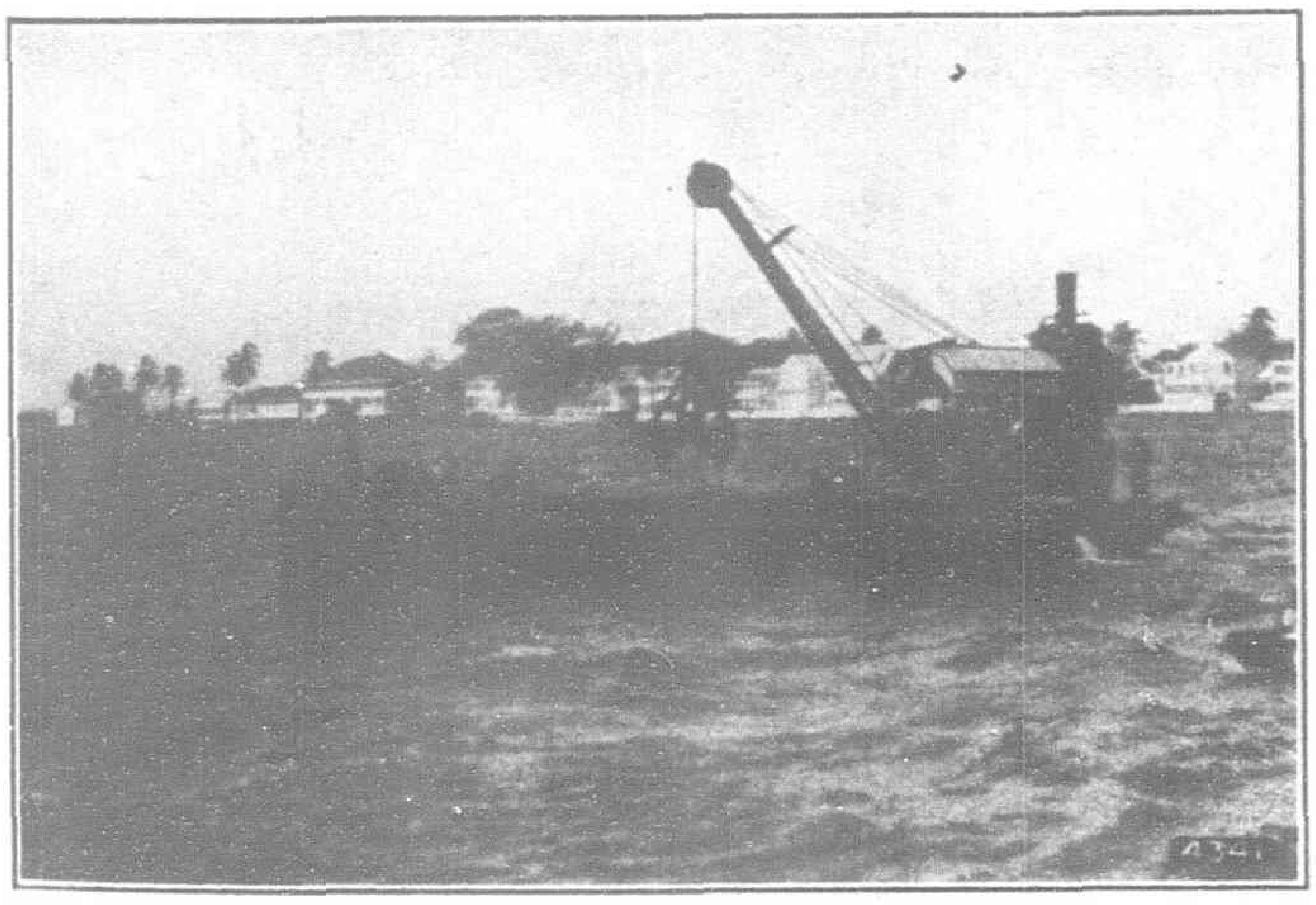
York manufactures Refrigerating Machinery for Industrial Applications, Ice Cream and Dairy Plant Refrigeration and Equipment, Commercial Refrigerating Units for Retail Store

YORK
REFRIGERATION

PRIESTMAN Grab Dredgers for *every* kind of dredging

Simply change the grab when you are going to dredge clay instead of mud, rock instead of sand. There is a Priestman grab for everything. A *grab* dredger is outstandingly simple — adaptable — economical.

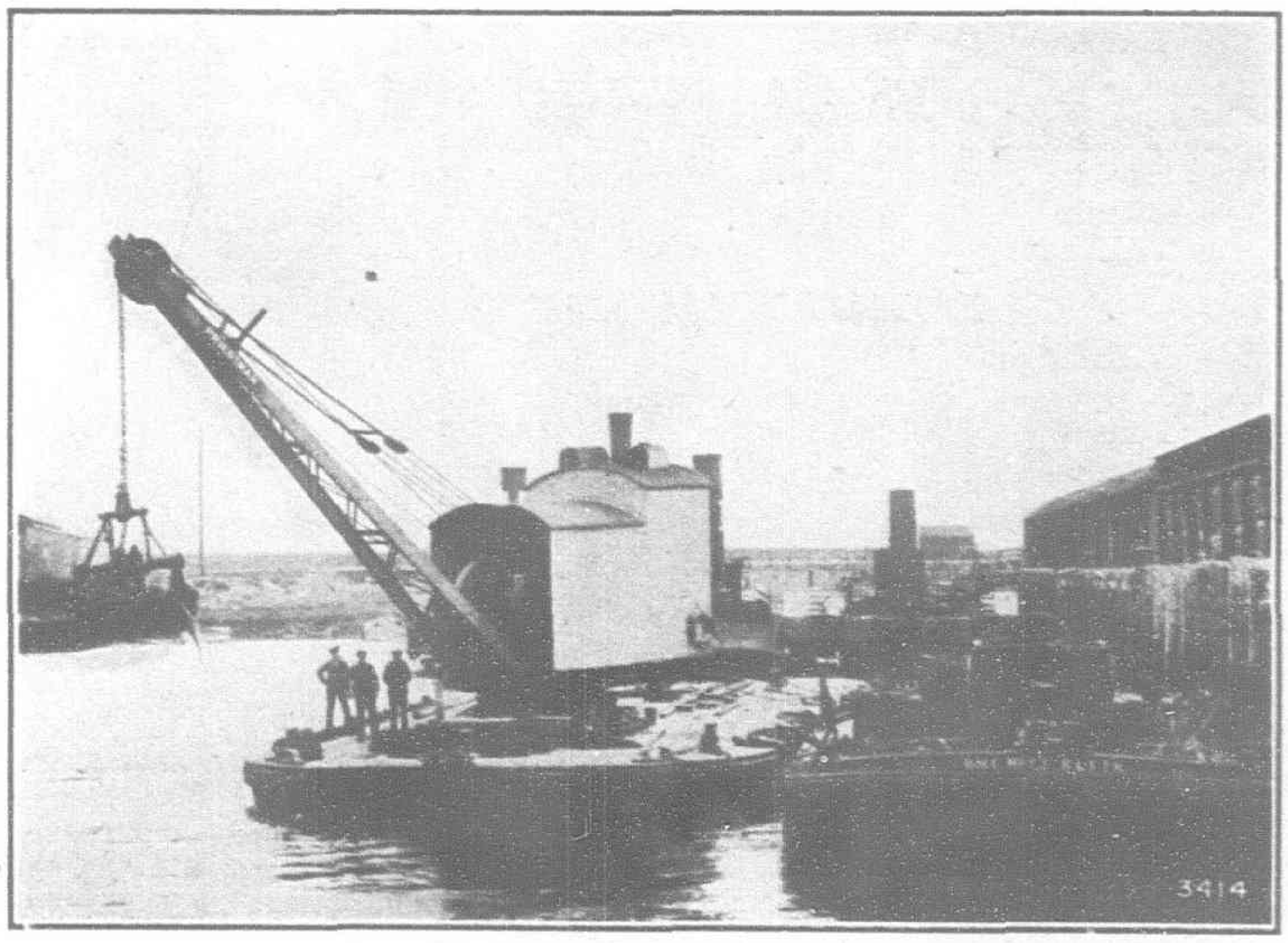
Please write for catalogues.



A self propelling dredger with a grab of 1 cu-yd. and a hopper of 50 tons supplied to British Honduras.

PRIESTMAN
DREDGERS - EXCAVATORS - GRABS

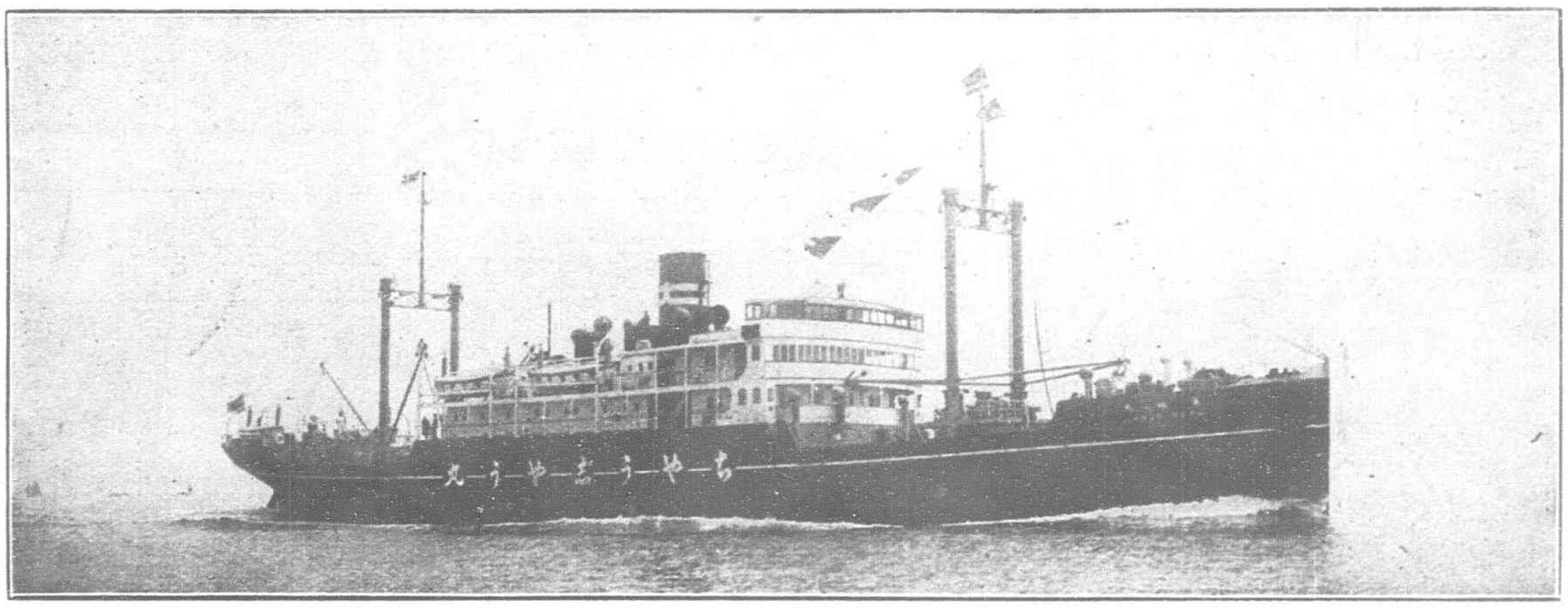
Priestman Bros., Ltd., Holderness Foundry, Hull.
Cables : " Priestman, Hull "
28 Victoria St., London, S. W. I.
Cables : " Priestman, London "
Middleton & Co., Ltd., 2 Canton Road, Shanghai.
Reiss, Massey & Co., Ltd. Hongkong.
Kabushiki Kaisha Yonei Shoten, 3 Nichome, Ginza, Tokyo.
Agents Throughout The World.



A typical Priestman dredger for harbors and docks. It has a 2 cu-yd. grab, and loads into barges drawn alongside.

O.S.K. LINE

50 Mail, Passenger and Freight Services with a Fleet of 150 Vessels aggregating 500,000 Tons.



M. S. "Chojo Maru" One of Three Sister Boats on the Osaka-Tientsin Line

PRINCIPAL REGULAR LINES:

JAPAN-EUROPEAN LINE (Monthly)

Yokohama	Kobe	Dairen	Shanghai
Hongkong	Singapore	Colombo	Aden
Suez	Port Said	London	Rotterdam
Hamburg	Bremen	Dunkirk	Antwerp

NEW YORK LINE (24 Sailings a Year)

Hongkong (Keelung)	Shanghai	Dairen	Taku
Kobe	Yokkaichi	Yokohama	Los Angeles
Panama	New York	Boston	Philadelphia
Baltimore			

SOUTH AMERICAN LINE (2 Sailings a Month)

(A Unique Round the World Service)

Yokohama	Kobe	Hongkong	Saigon
Singapore	Colombo	Durban	Port Elizabeth
Cape Town	Rio De Janeiro	Santos	Montevideo
Buenos Aires	New Orleans	Galveston	Cristobal
Los Angeles	Yokohama		

AUSTRALIAN LINE (Monthly)

Yokohama	Otaru	Yokohama	Nagoya
Osaka	Kobe	Moji	Hongkong
Manila	Brisbane	Sydney	Melbourne
Wellington	Auckland		

BOMBAY LINE (Fortnightly)

Yokohama	Nagoya	Yokkaichi	Osaka
Kobe	Moji	Hongkong	Singapore
Penang	Belawandeli	Colombo	Bombay
Karachi	Shanghai	(Upward only)	

JAPAN-CALCUTTA LINE (Fortnightly)

Yokohama	Nagoya	Osaka	Kobe
Moji	Hongkong	Singapore	Penang
Belawandeli	Rangoon	Calcutta	

AFRICAN LINE (Monthly)

(Extending to South America)

Yokohama	Nagoya	Osaka	Kobe
Moji	Hongkong	Singapore	Colombo
Mombasa	Zanzibar	Dar-Es-Salaam	Beira
Lourenco Marques	Durban	Port Elizabeth	Cape Town
Rio De Janeiro	Santos	Buenos Aires	

SOUTH SEAS LINE (Monthly)

Yokohama	Nagoya	Osaka	Kobe
Moji	Keelung	Manila	Tawao
Sourabaya	Tjilachap	Macassar	

SAIGON-BANGKOK LINE (Monthly)

Yokohama	Nagoya	Osaka	Kobe
Moji	Keelung	Saigon	Bangkok

JAPAN-PHILIPPINE LINE (Fortnightly)

Yokohama	Nagoya	Osaka	Kobe
Moji	Nagasaki	Manila	Cebu
Zamboanga	Davao		

KOBE-KEELUNG LINE (3 Sailings per Fortnight)

Kobe	Moji	Keelung

SERVICES TO CHINA:—

Osaka-Dairen Line	Every 3 days' sailing	Takao-Tientsin Line	2 to 3 Sailings per month
Osaka-Tientsin Line	3 Sailings a Fortnight	Takao-Canton Line	Fortnightly
Osaka-Tsingtao Line	2 ,, ,, ,,	Keelung-Hongkong Line	Weekly
Yokohama-Tientsin Line	4 ,, ,, ,,	Keelung-Foochow-Amoy Line	3 Sailings per month

Besides the above mentioned, Mail and Passenger Services are maintained by over Thirty Regular Lines, calling at all important ports in Japan, as well as the Straits, Dutch East Indies, Formosa, China, Korea, etc., etc.

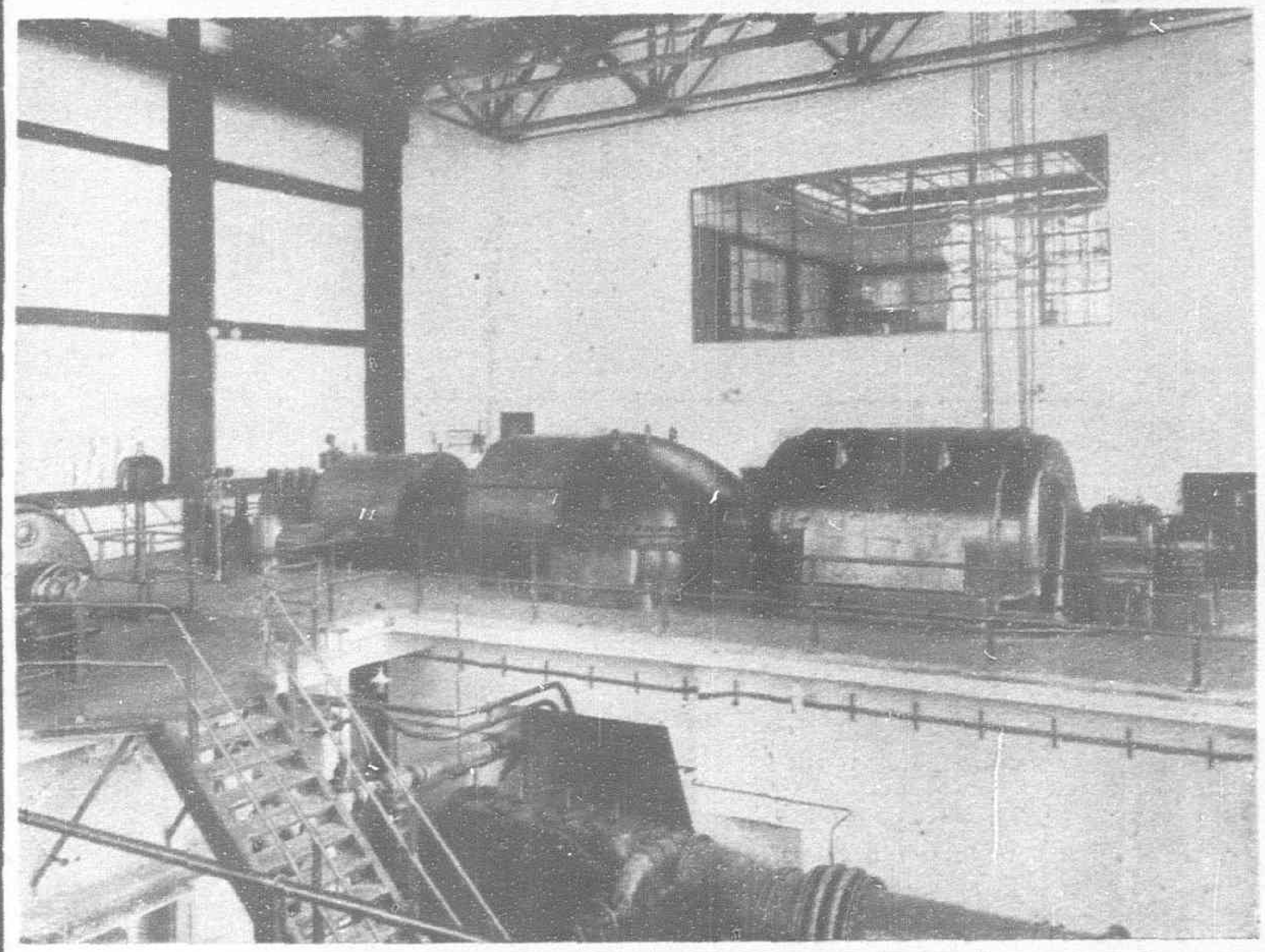
COMPANY'S LOCAL OFFICES AND AGENCIES IN CHINA

Hongkong, Swatow, Amoy, Canton, Foochow, Hankow, Shanghai, Tsingtao, Tientsin, Dairen and Chefoo.

SKODA WORKS

斯
可
達

FAR EASTERN OFFICES
MUKDEN SHANGHAI HARBIN



COMPLETE POWER PLANT EQUIPMENTS:

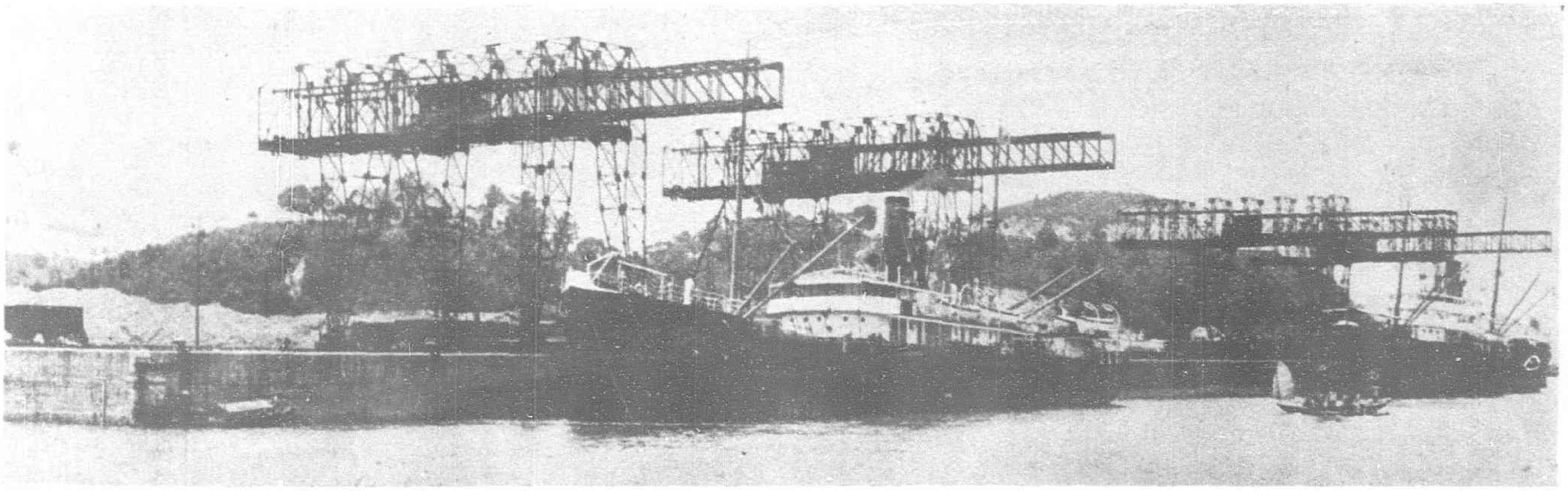
BOILERS * TURBINES * GENERATORS
SWITCHPLANTS

The inset shows one portion of the Turbine Room of the new Chapei Power plant—Shanghai
Steam pressure on boilers 560 lbs. Steam Temperature 730°F, Line Voltage 33,000 V.

基 HONGAY COAL 鴻

Ste. FRANCAISE DES CHARBONNAGES DU TONKIN

Head Office: PARIS
General Sales Department: QUEEN'S BUILDING, HONGKONG
Mines: HONGAY (Indo-China)



The Quays at Campha

THE BEST FOR BOILERS AND BUNKERS
and for
HOUSEHOLD, CENTRAL HEATING FOR PRIVATE HOUSES, OFFICES AND APARTMENT BUILDINGS

Exported to:
HONGKONG
JAPAN
CHINA
MANILA
STRAITS SETTLEMENT
SIAM
U.S.A.
CANADA

Sales Agencies: In all these Countries

Agent for Central China
F. HARDIVILLIERS, 12 The Bund, 2nd floor, Shanghai

BUTTERFIELD & SWIRE

FRENCH BUND, SHANGHAI
Telephone No. Central 4881
AGENTS FOR

Amoy
Antung
Canton
Changsha
Chefoo
Chinkiang
Chungking
Dalny
Hankow
Harbin
Hongkong
Ichang
Kiukiang
Kobe
Nanking
Newchwang
Ningpo
Shanghai
Shasi
Swatow
Tientsin
Tsingtao
Wuhu
Yokohama

BLUE FUNNEL LINE

Fast Cargo Services: From Japan, China, Hongkong, Philippines, Strait and Java to Europe via Suez Canal and to New York viz Suez Canal; also Trans-Pacific between Oriental Ports and West Coast of N. America.

Fast Passenger Service: Carrying first class passengers only, maintaining approximately a monthly service homeward from Shanghai and Hongkong to London via Straits, Colombo, Port Said and Marseilles, Outwards from Liverpool via Port Said to Straits, Hongkong, Shanghai and North China.

CHINA NAVIGATION CO., LTD.

Passenger and Freight Steamship Services

SHANGHAI TO, AND FROM,

Weihaiwei, Chefoo and Tientsin (for Peking): Tsingtao, Newchwang; Antung.

Hankow, Ichang, Chungking, Changsha, and Intermediate Yangtze Ports.

Hongkong and Canton; Amoy and Swatow; Ningpo; and General Coasting Services.

HONGKONG TO, AND FROM,

Weihaiwei, Chefoo and Tientsin (for Peking)

Canton; Hoihow, Pakhoi and Haiphong; Bangkok and Singapore.

Amoy and Swatow.

Shanghai and Yangtze Ports (as above)

Sydney, Melbourne and Australian Ports (Australian-Oriental Line)

TAIKOO SUGAR REFINING CO., LTD.

太古

FINEST CANE SUGARS

TAIKOO DOCKYARD & ENGINEERING COMPANY OF HONGKONG LIMITED

Ship Builders, Ship Repairers, Engine Builders, Boiler Makers, etc.

AMERICAN PIONEER LINE

Manila—Hongkong—Shanghai to New York

FAR EAST TO NEW YORK AND ATLANTIC COAST PORTS VIA PANAMA CANAL

MOTORSHIP	Voyage No.	Manila sail —1932—	Hongkong sail —1932—	Shanghai sail —1932—	Panama sail —1932—	New York arrive —1932—	MOTORSHIP
"TRIUMPH"	5/64	Jan. 28	Feb. 1	Feb. 7	Mar. 8	Mar. 15	"TRIUMPH"
"COURAGEOUS"	6/62	Feb. 26	Mar. 1	Mar. 7	April 6	April 13	"COURAGEOUS"
"WICHITA"	6/56	Mar. 28	April 1	April 7	May 7	May 14	"WICHITA"
"DEFIANCE"	6/63	April 28	May 1	May 7	June 7	June 13	"DEFIANCE"

Cargo also accepted for Boston, Philadelphia and Baltimore

Through bills of lading issued to all U. S. interior points and to all ports in Cuba, the West Indies, Central and South America.

UNITED STATES SHIPPING BOARD (Owners)
ROOSEVELT S.S. COMPANY INC. (Managing Operators)

TIENTSIN
TSINGTAU
DAIREN
CHEFOO

STATES STEAMSHIP COMPANY, *General Agents—Orient*
Sassoon House, Shanghai.
Cable: "STATESLINE"

MANILA
ILOILO
CEBU
HONGKONG

M A N

MASCHINENFABRIK AUGSBURG-NÜRNBERG A.G.

M.A.N.—LJUNGSTROM TURBINES

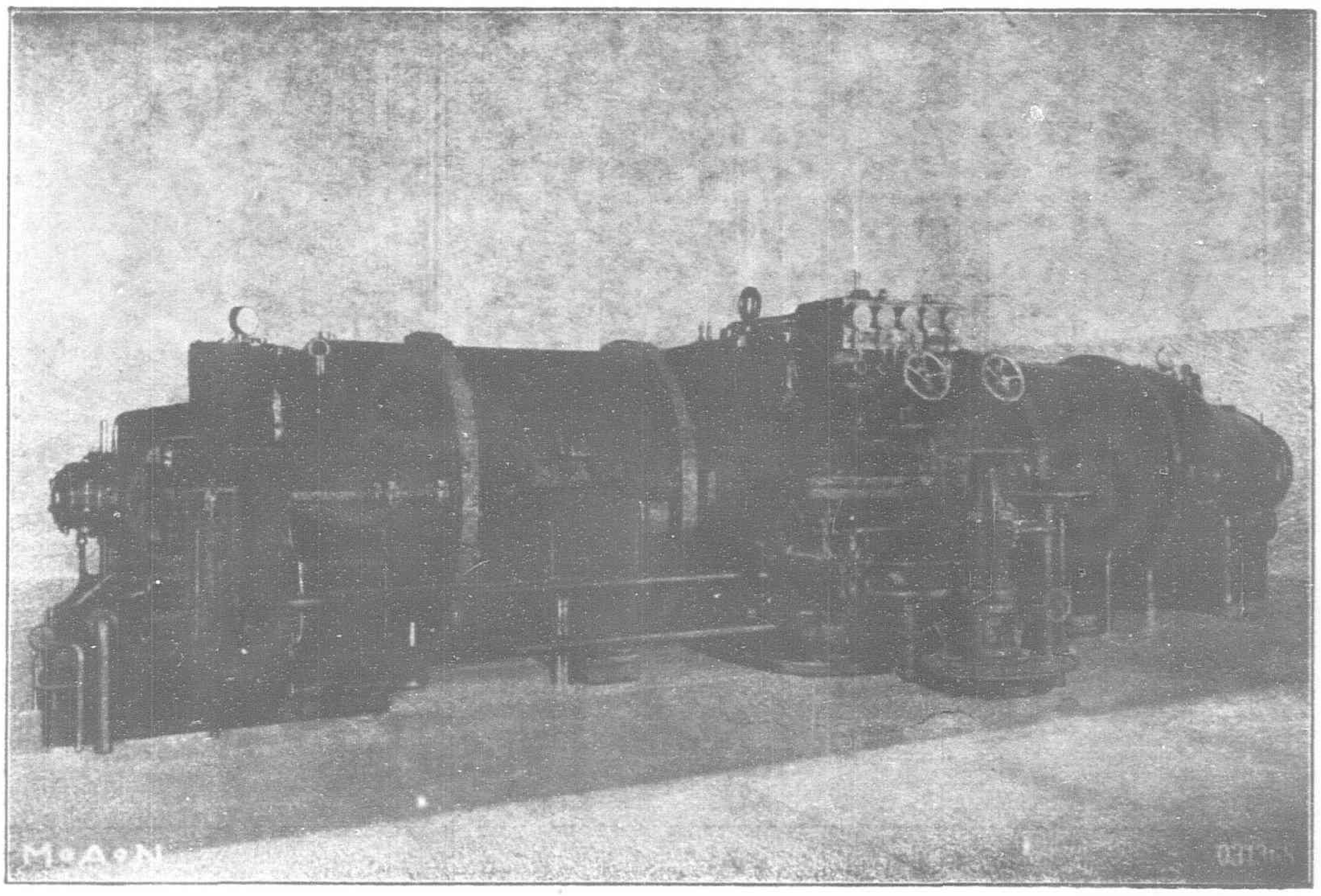
Low Steam Consumption
Ease of Operation
Quick Starting
Low Lub-oil Consumption
Maximum Efficiency
Low Cost of Foundations and Buildings

For further particulars apply to :

Gutehoffnungshuette M.A.N. Works

Agents in China :
Messrs. KUNST & ALBERS,
29 Szechuen Road, Shanghai

Agents in Japan :
Messrs. ILLIES & CO., Tokyo



12,000 kw. M.A.N. Ljungstrom Turbo Generator

SUGAR

Softs
Cubes
Cuts
Powdered

TRADE MARK S

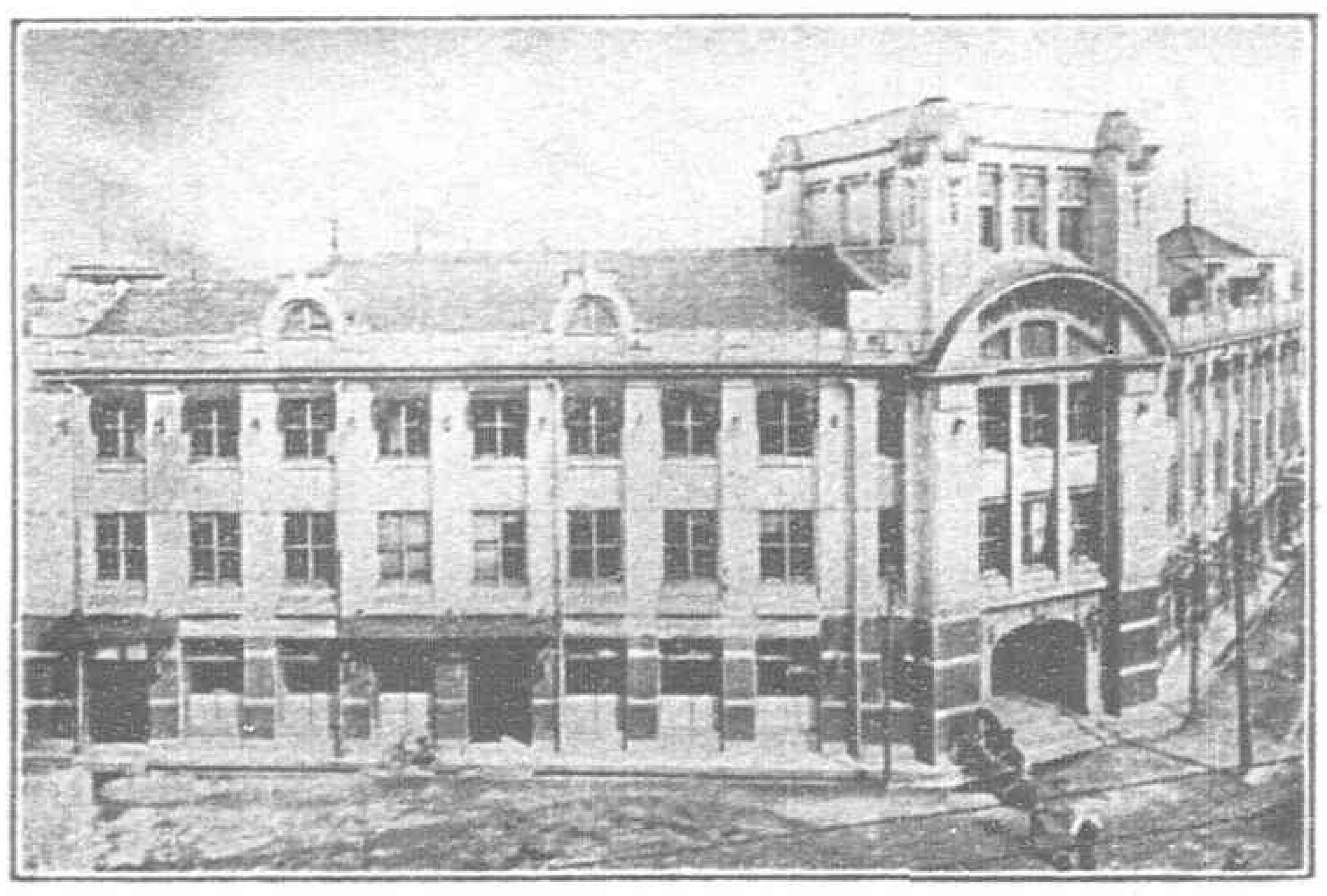
Granulated
Plantation
Centrifugals

THE JAPAN SUGAR M.F.G. Co., Ltd.

(Dai Nippon Seito Kabushiki Kaisha)
ESTABLISHED 1896
Raita Fujuyama, *President*

Authorized Capital	Y.51,416,600.
Paid-up Capital	Y.34,749,100.
Reserve Fund	Y.17,621,700.

Head Office: Showa Building, Marunouchi, Tokyo, Japan.
Cable Address: "Sugar" Tokyo.
Codes Used: A.B.C. 6th Edition and Bentley's.
Branches: Osaka, Nagoya, Keijo, Shanghai and Soerabaja.
Factories: Tokyo, Osaka, Moji, Korea, Formosa, Java and Daitojima.



General Office Building of Ujigawa Electric Power Co., Ltd., Osaka, Japan.

Ujigawa Electric Power Co., Ltd.

Osaka, Japan.

Authorized Capital Yen 85,000,000.00

Yasushige Hayashi, *President and Director*
Senzaburo Kageyama, *Managing Director*

17 Power houses (erected) with a total capacity of	111,700 K.W.
4 Power houses (under construction) with a total capacity of	31,600 K.W.
9 Power houses (permit obtained) with a total capacity of	83,400 K.W.
15 Power houses (permit applied) with a total capacity of	36,200 K.W.
Grand Total	262,900 K.W.
Power supplied	267,021 H.P.
Its Customers	14,568
Electric Lights	319,186
Its Customers	146,040
Purchased Power	100,100 K.W.

PILSENER BEER
GRAND PRIZES
ASAHI BEER
DAI NIPPON BREWERY COMPANY LIMITED TOKYO JAPAN
TRADE MARK
ASAHI
LAGER BEER
SPECIALLY BREWED FOR EXPORT

ASAHI BEER

AMCO

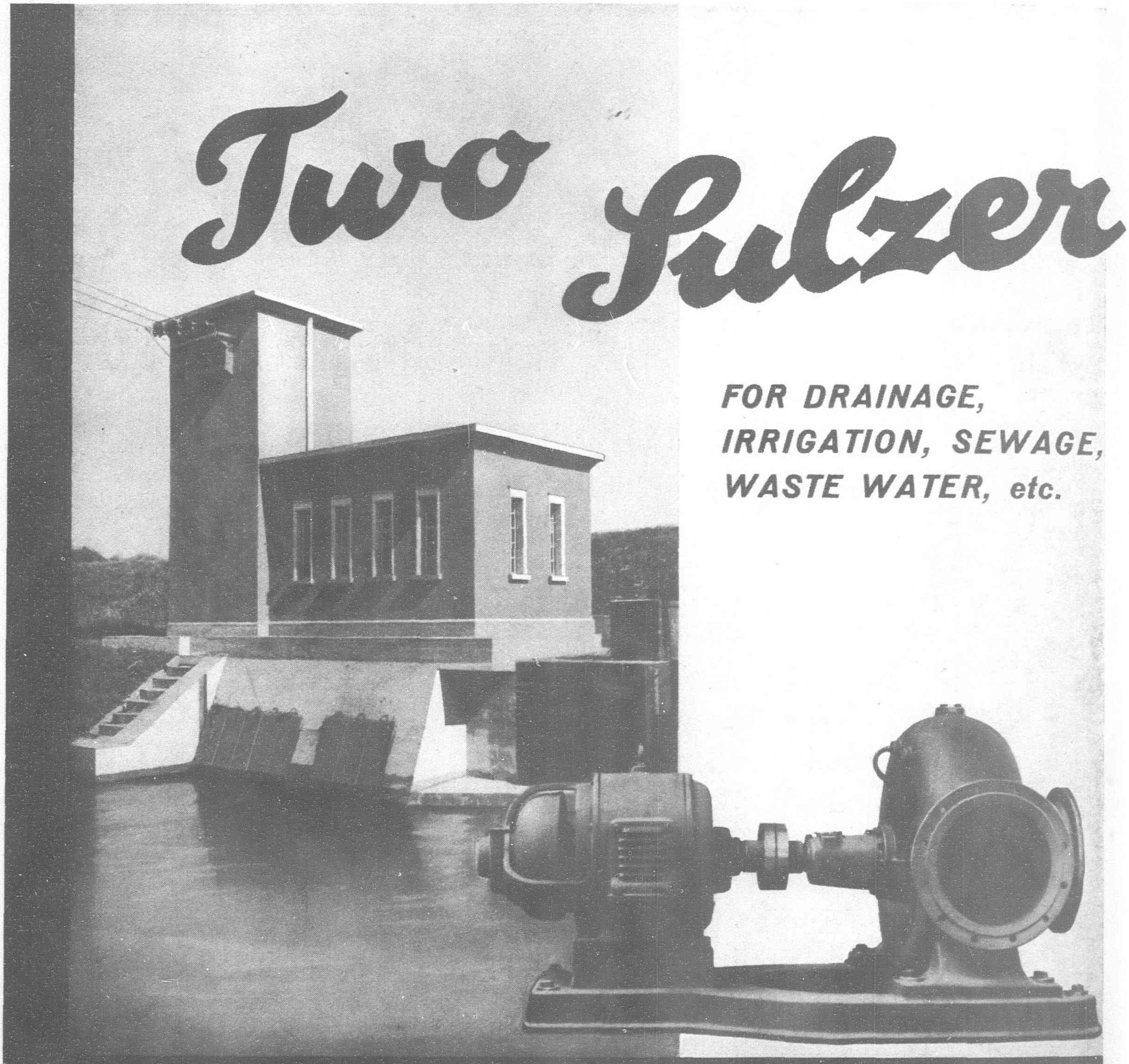
ANDERSEN, MEYER & COMPANY, LTD.

ENGINEERS AND CONTRACTORS
GENERAL IMPORTERS, MANUFACTURERS

Agricultural Machinery, Motor Trucks and Buses
Airplanes
Building Supplies
Drugs and Chemicals
Electrical Engineering and Supplies
Electrical Installations
General Electric Refrigerators
Heating and Plumbing Supplies
Mechanical Engineering and Supplies
Power Engineering and Supplies
Railways Equipments and Supplies
Refrigerating Machinery
Textile Manufacturing and Engineering
X-Ray Outfits

Large stock carried of drawing instruments and materials
Estimates and descriptive literature on request

Head Office:
4-5 and 8 Yuen Ming Yuen Road, Shanghai
P. O. Box 265



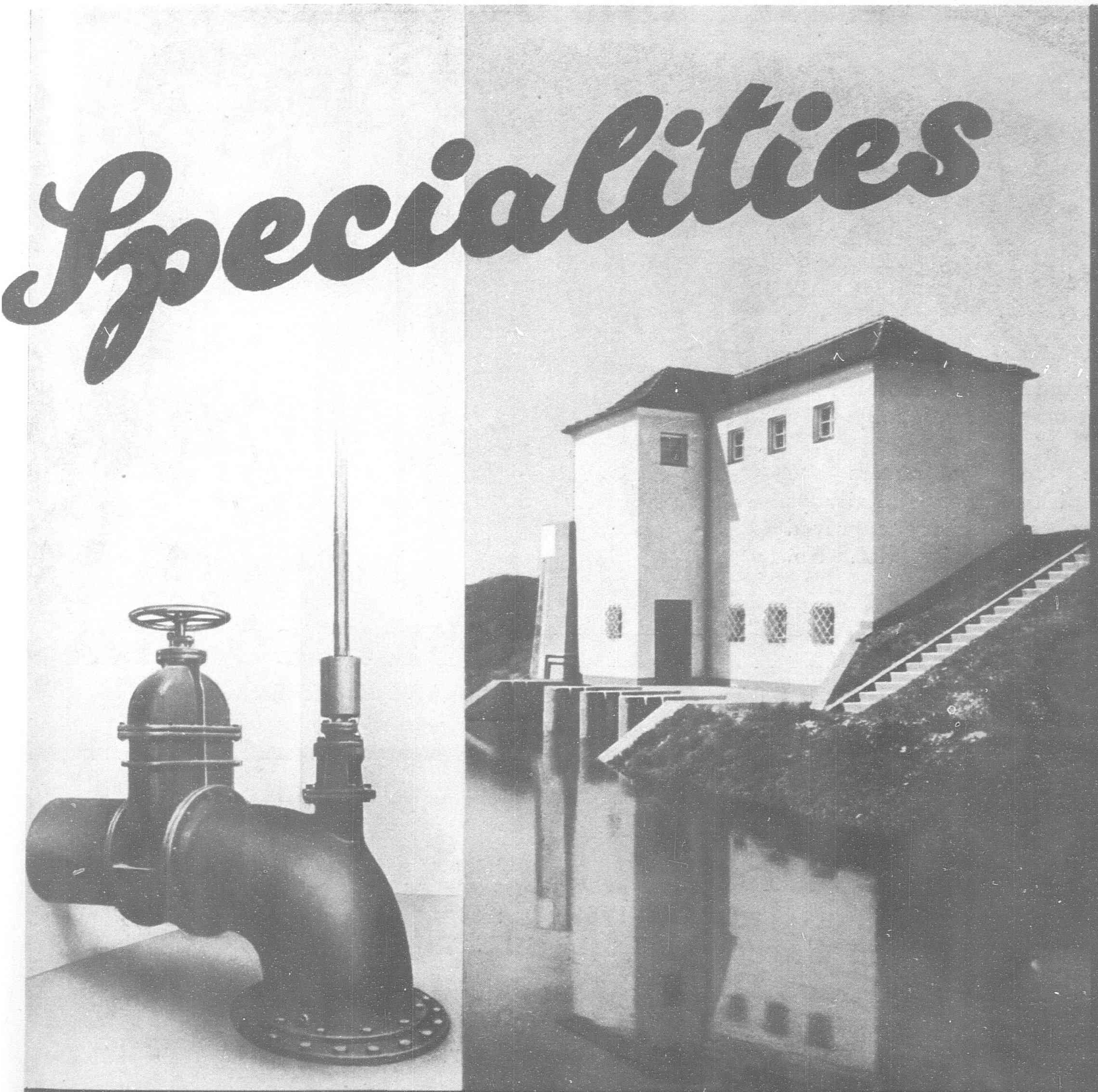
SULZER SCREW PUMPS

FOR MEDIUM QUANTITIES OF WATER, MEDIUM HEADS, HIGH SPEED

SULZER BROTHERS, LIMITED, WINTERTHUR (SWITZERLAND)

SHANGHAI: *SULZER BROTHERS*
Engineering Office - 4 Avenue Edward VII

KOBE: *SULZER BROTHERS*
Engineering Office - 72 Kyo-Machi



SULZER PROPELLER PUMPS

FOR LARGE QUANTITIES OF WATER, LOW HEADS, HIGH SPEED

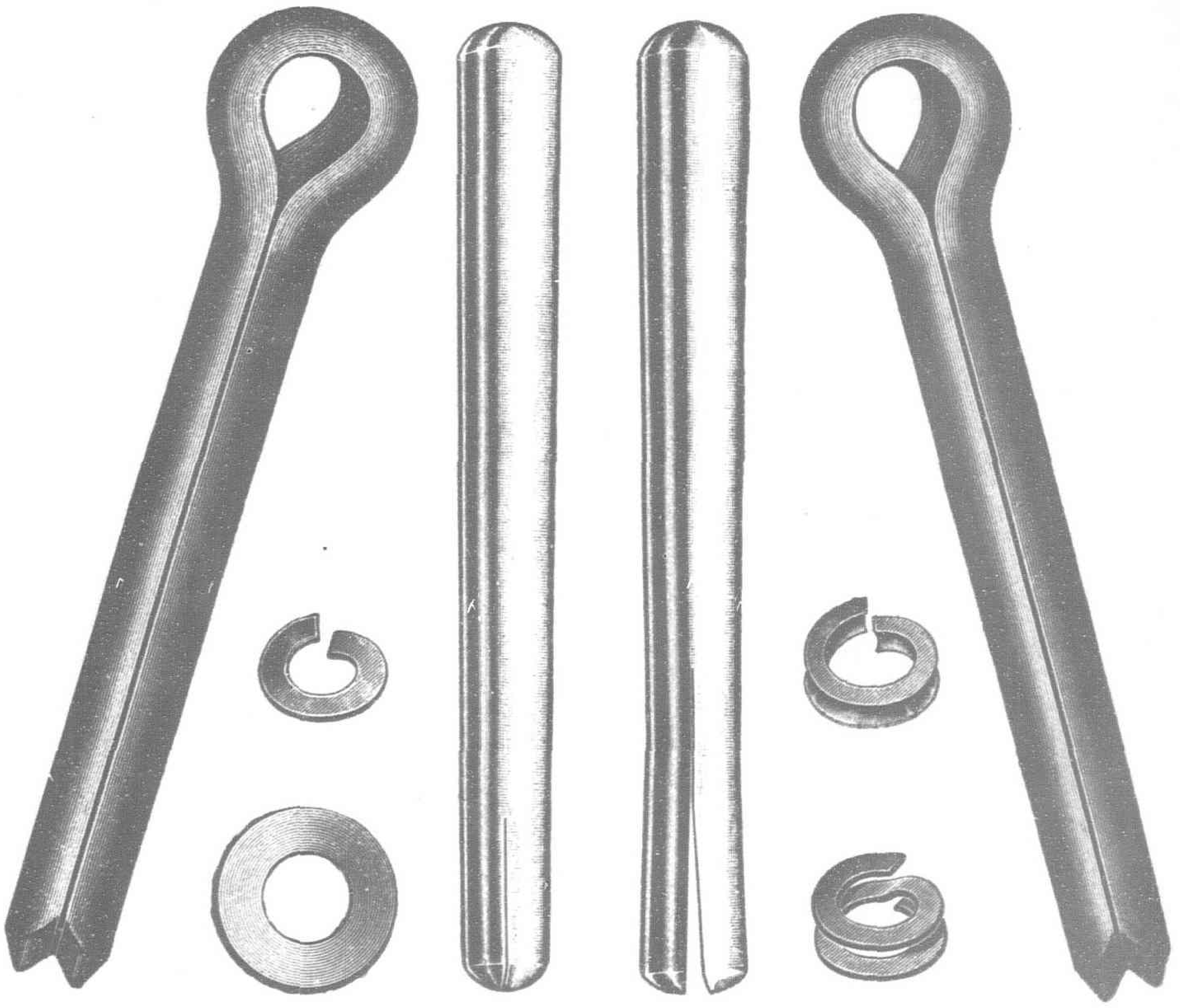
SULZER BROTHERS, LIMITED, WINTERTHUR (SWITZERLAND)

SHANGHAI: *SULZER BROTHERS*
Engineering Office - 4 Avenue Edward VII

KOBE: *SULZER BROTHERS*
Engineering Office - 72 Kyo-Machi

24296

"B. W. C." COTTERS, TAPERS, WASHERS



We solicit your enquiries for the above for which we can offer exceptionally keen prices.

We are contractors to English and Foreign Railways also Air Ministry approved firm (Authority Ref. No. 776,926/27).

BIRMINGHAM WIREWORKS CO., LTD.

Forward Works, Golden Hillock Road, SPARKBROOK, BIRMINGHAM

We are prepared to consider agents for various parts of the Far East

---

ATTWATER & SONS

ESTABLISHED 1868

Hopwood Street Mills, PRESTON, ENGLAND

MICA and MICANITE

IN ALL FORMS AND QUALITIES.

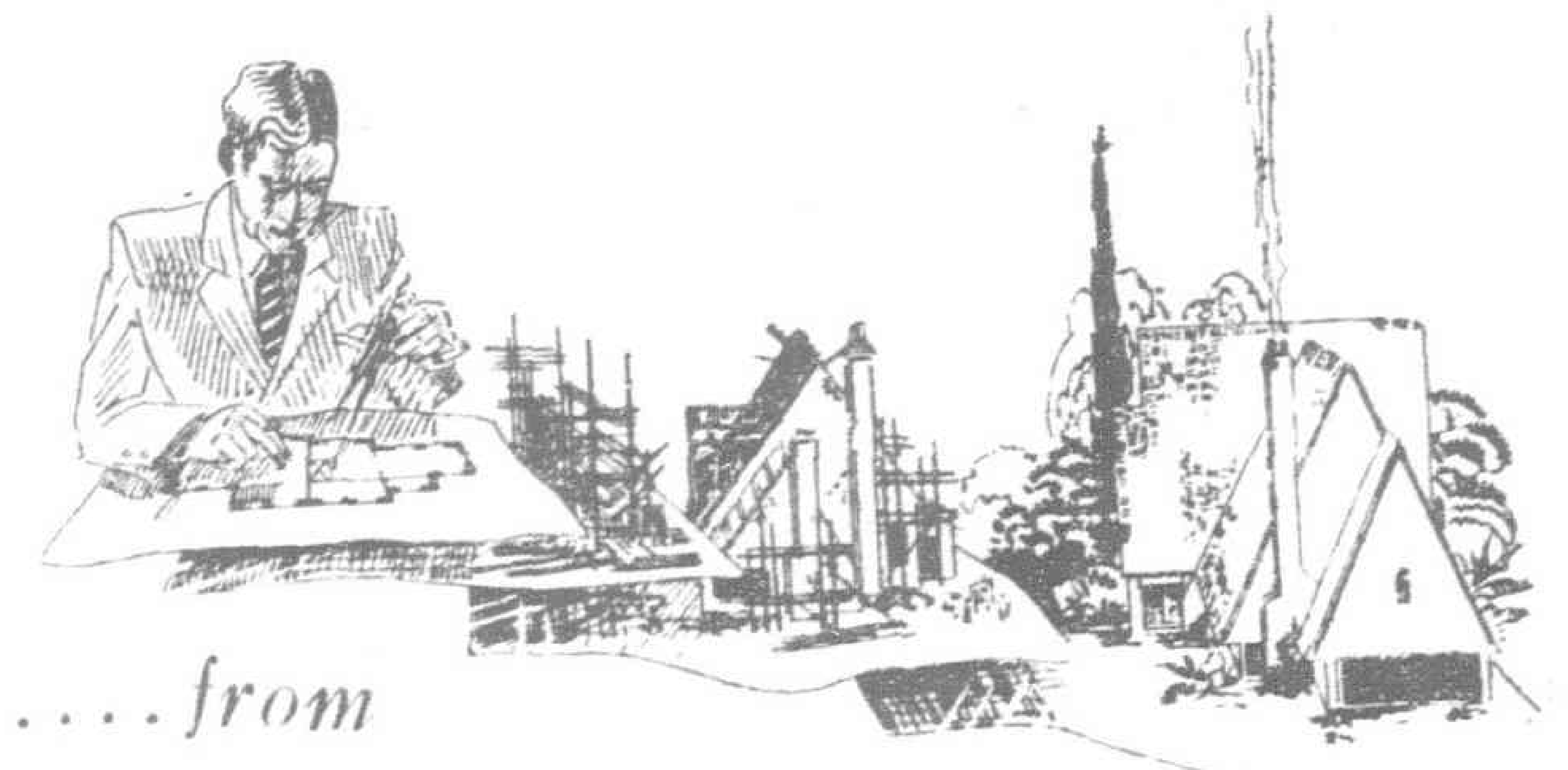
BAKELITE SHEETS, TUBES, BOBBINS, VARNISH and RESIN for OIL SWITCH GEAR and TRANSFORMERS. VULCANISED FIBRE, SHEETS, TUBES and RODS. PEERLESS LEATHEROID INSULATION EMPIRE CLOTH and TAPES. COTTON and also ASBESTOS DYNAMO TAPES.

PRESSPAHN AND FULLERBOARD IN SHEET AND ROLLS

WHILE I LIVE I'LL CROW

REGD TRADE MARK

EBONITE AND ALL INSULATING MATERIAL FOR ELECTRICAL ENGINEERS



. . . . from

blueprint

to COMPLETED STRUCTURE

A man who wishes to erect a building is frequently, somewhat at a loss as to the materials to be used, the style he wishes to have, and the equipment his structure demands. He is then in need of professional advice.

Every fact connected with the putting up of a building, from blue print to completed structure, can be placed before you by our staff, be it for dwelling house, office building, power plant, or factory.

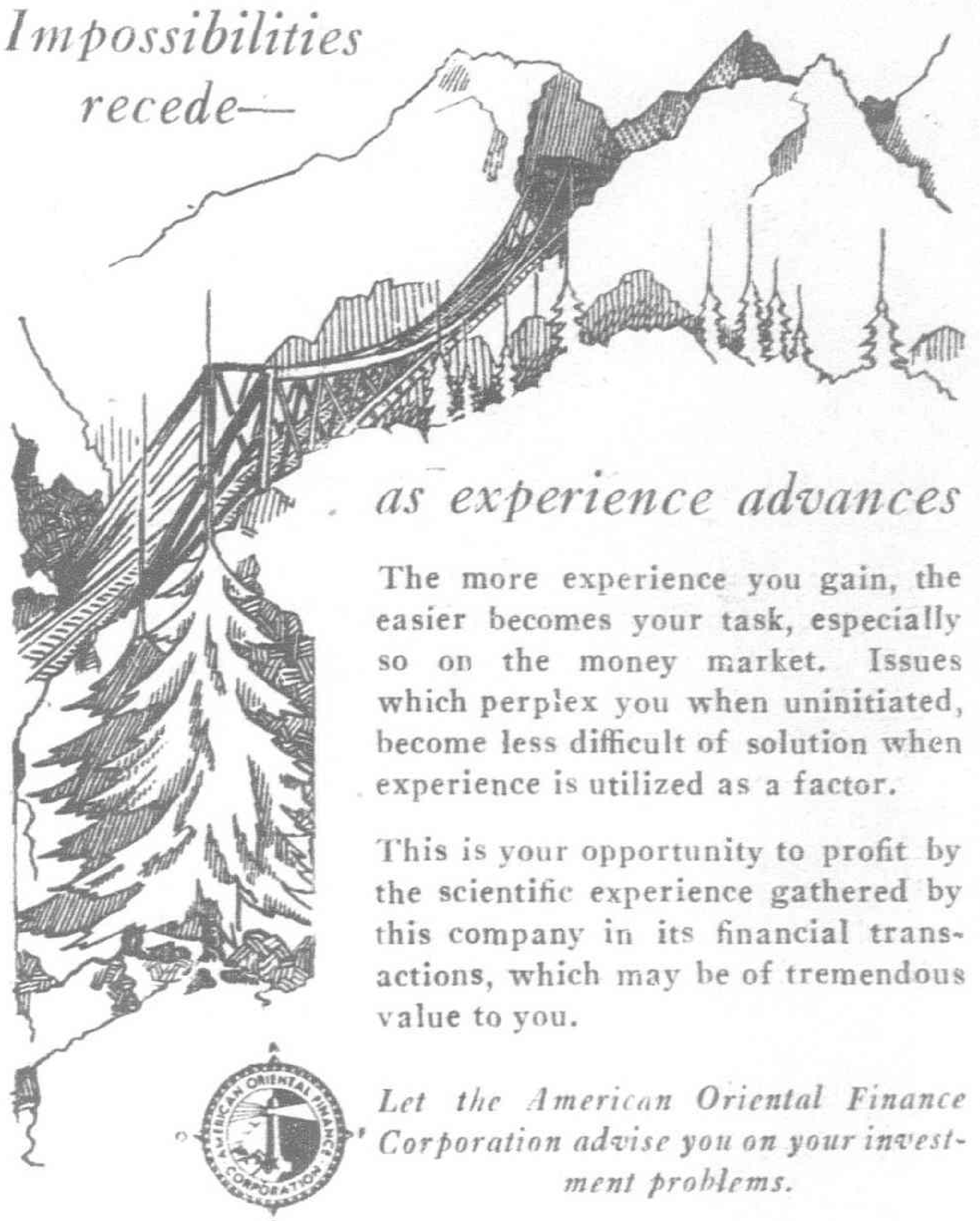
We are qualified to handle every detail of the job, develop plans in accordance with present and future requirements, design the structure, purchase the materials, erect the building, and equip it in modern and satisfactory style.

Any advice you need when thinking of a structure, no matter how detailed or intricate your requirements may be, the Asia Realty Company can supply, and this places you under no obligation to do business with the company unless you so desire.

ASIA REALTY COMPANY

FED. INC., U.S.A.

50 NANKING ROAD - TELEPHONE 18770



Impossibilities recede—

as experience advances

The more experience you gain, the easier becomes your task, especially so on the money market. Issues which perplex you when uninitiated, become less difficult of solution when experience is utilized as a factor.

This is your opportunity to profit by the scientific experience gathered by this company in its financial transactions, which may be of tremendous value to you.

Let the American Oriental Finance Corporation advise you on your investment problems.

American Oriental Finance Corporation

29 NANKING ROAD - - - TELEPHONE 11300

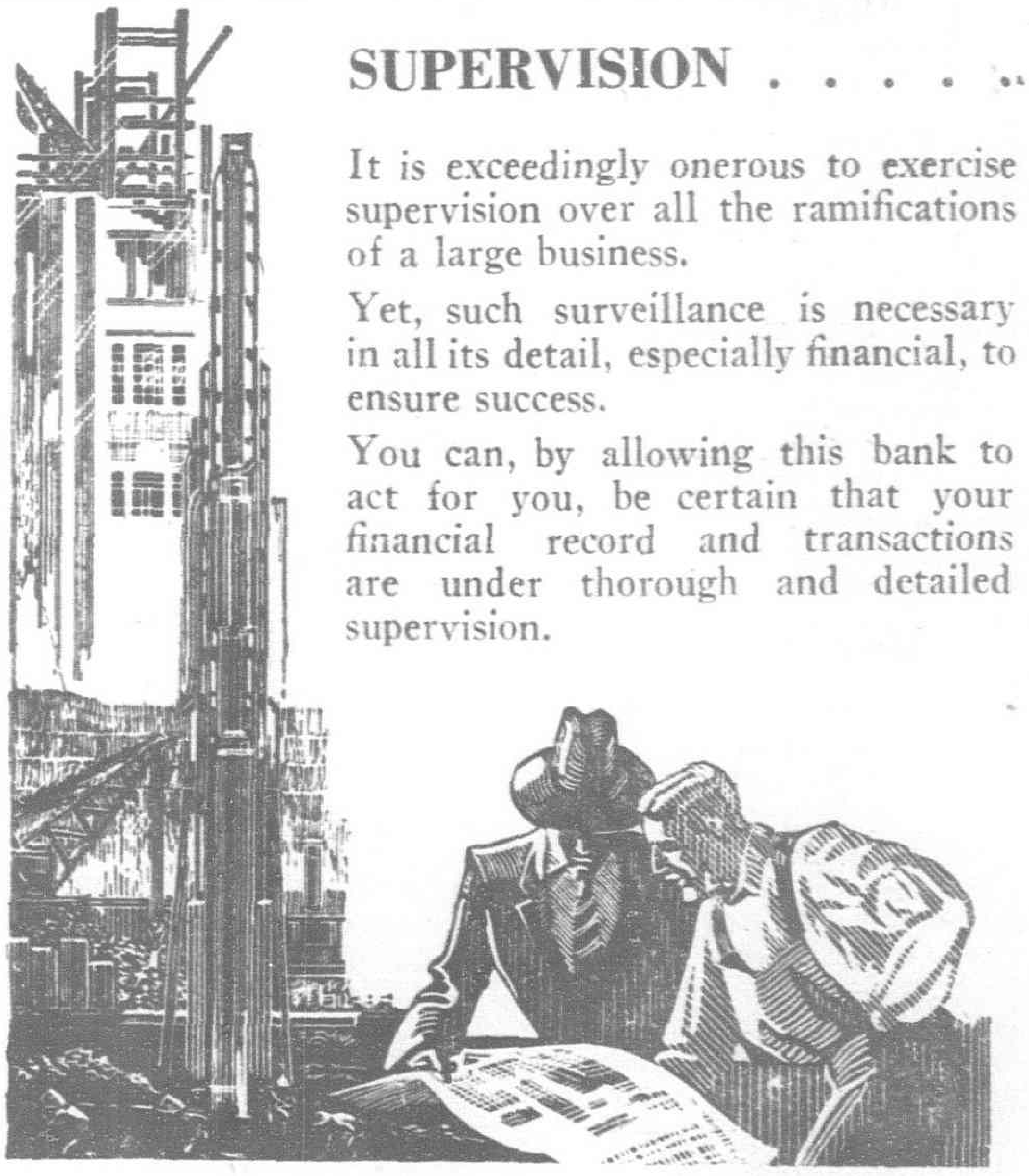
The
DEVELOPMENT
of Trusteeship from 1830 to 1900

After the first three decades of the 19th century corporate trusteeship showed an interesting trend away from its mother, the Life Insurance Company, towards the fields of banking and finance. After the Civil War and the reconstruction period, men had discovered that *the conserving of fortunes was even more difficult than the making of them*, and by 1900 the idea of corporate trusteeship was well established in all its various services. The Raven Trust Company is the pioneer specialist in this field in China. It is fully equipped to engage in all corporate and individual fiduciary activities.

RAVEN TRUST COMPANY

FEDERAL INC., U.S.A.

29 NANKING ROAD - - - - TELEPHONE: 11300



SUPERVISION . . . . . .

It is exceedingly onerous to exercise supervision over all the ramifications of a large business.

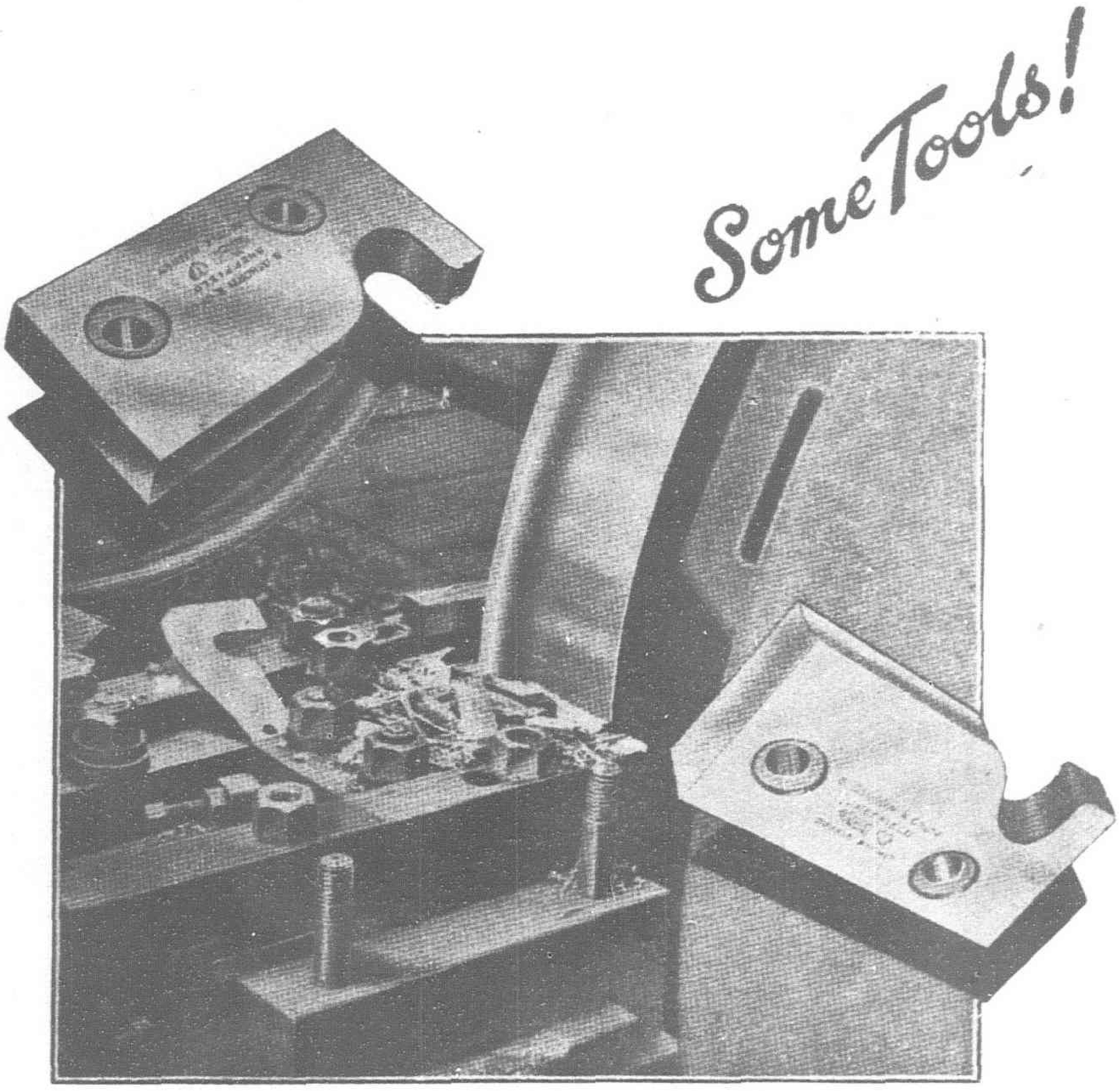
Yet, such surveillance is necessary in all its detail, especially financial, to ensure success.

You can, by allowing this bank to act for you, be certain that your financial record and transactions are under thorough and detailed supervision.

AMERICAN-ORIENTAL BANKING CORPORATION

The Bank of Personal Service

29 NANKING ROAD - - - - TELEPHONE: 11300



THE PHOTOGRAPH SHOWS TWO PROFILE TOOLS OF
OSBORN'S "DOUBLE MUSHET" HIGH SPEED STEEL
FINISHING LOCOMOTIVE SORBITIC TYRES

THESE tools finished 28 and 14 tyres before re-grinding was necessary. This was far in excess of the minimum requirements.
After a short lapse of time the tools were re-ground, and are now finishing I. S. R. Standard Carriage and Wagon Tyres to B. S. S. No. 5. So far they have

FINISHED 116 PAIRS WITHOUT RE-GRINDING AND ARE STILL RUNNING

These "Double Mushet" Tools are not special. They are of the same quality as all other "Double Mushet" turning, planing or slotting tools.

Sole Manufacturers

SAMUEL OSBORN & CO., LTD.
CLYDE STEEL WORKS
SHEFFIELD

China House: 2A Kiukiang Road, Shanghai
P. O. Box No. 612 Telephone 10104
Cable Add: "HANDHEART" Shanghai

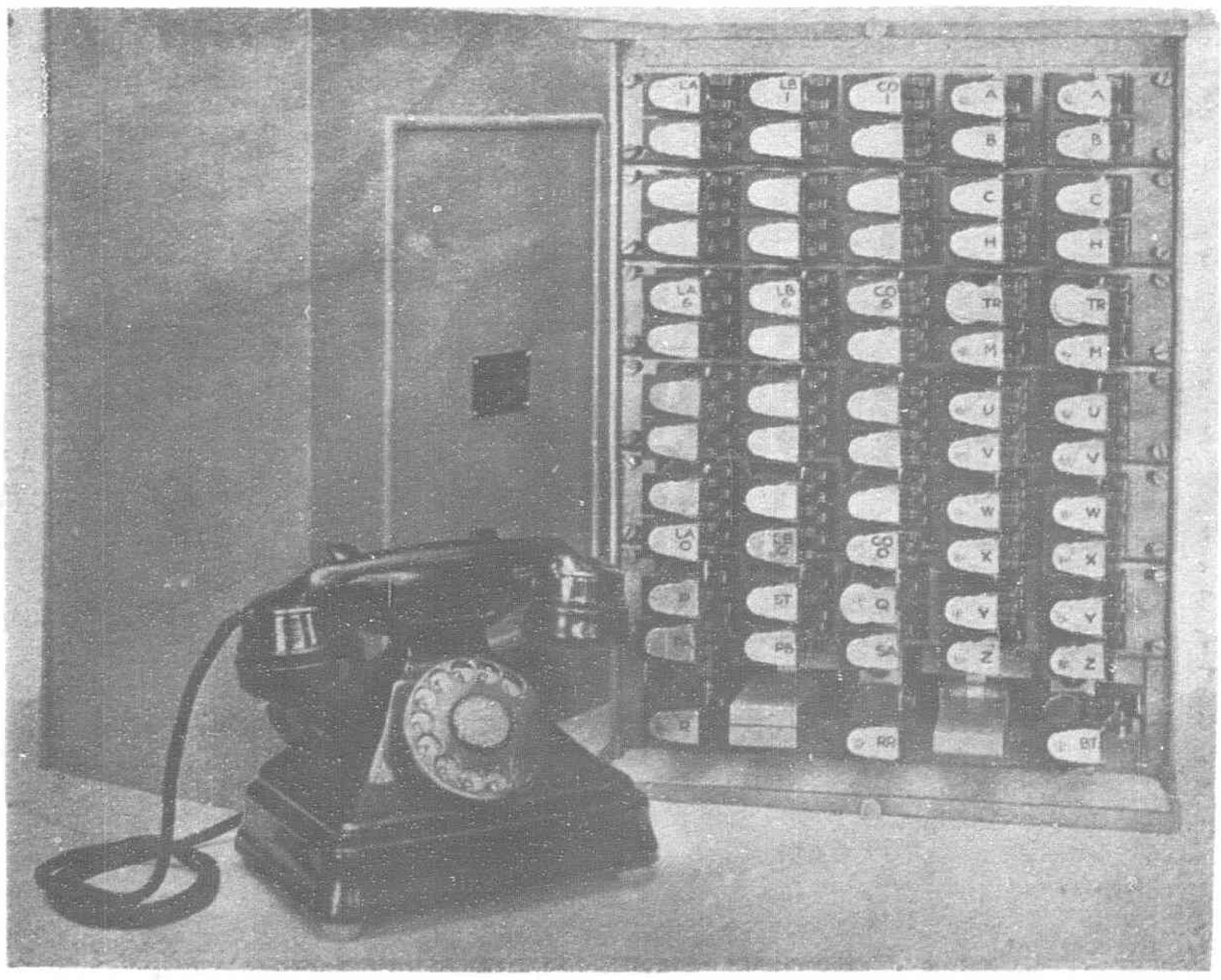
SIEMENS BROTHERS & CO., LTD., London, England

For Private Automatic Telephone Systems of any size from 10 to 1,000 lines

For
SECRECY
SPEED
AND
RELIABILITY

ECONOMICAL
AND
EASILY
MAINTAINED

Sole Manufacturers
of
THE
"NEOPHONE"
THE MOST
EFFICIENT
TELEPHONE
IN THE
WORLD



10 line Exchange operated directly from A. C. Mains
Dimensions: 26 by 30 by 11½ in.

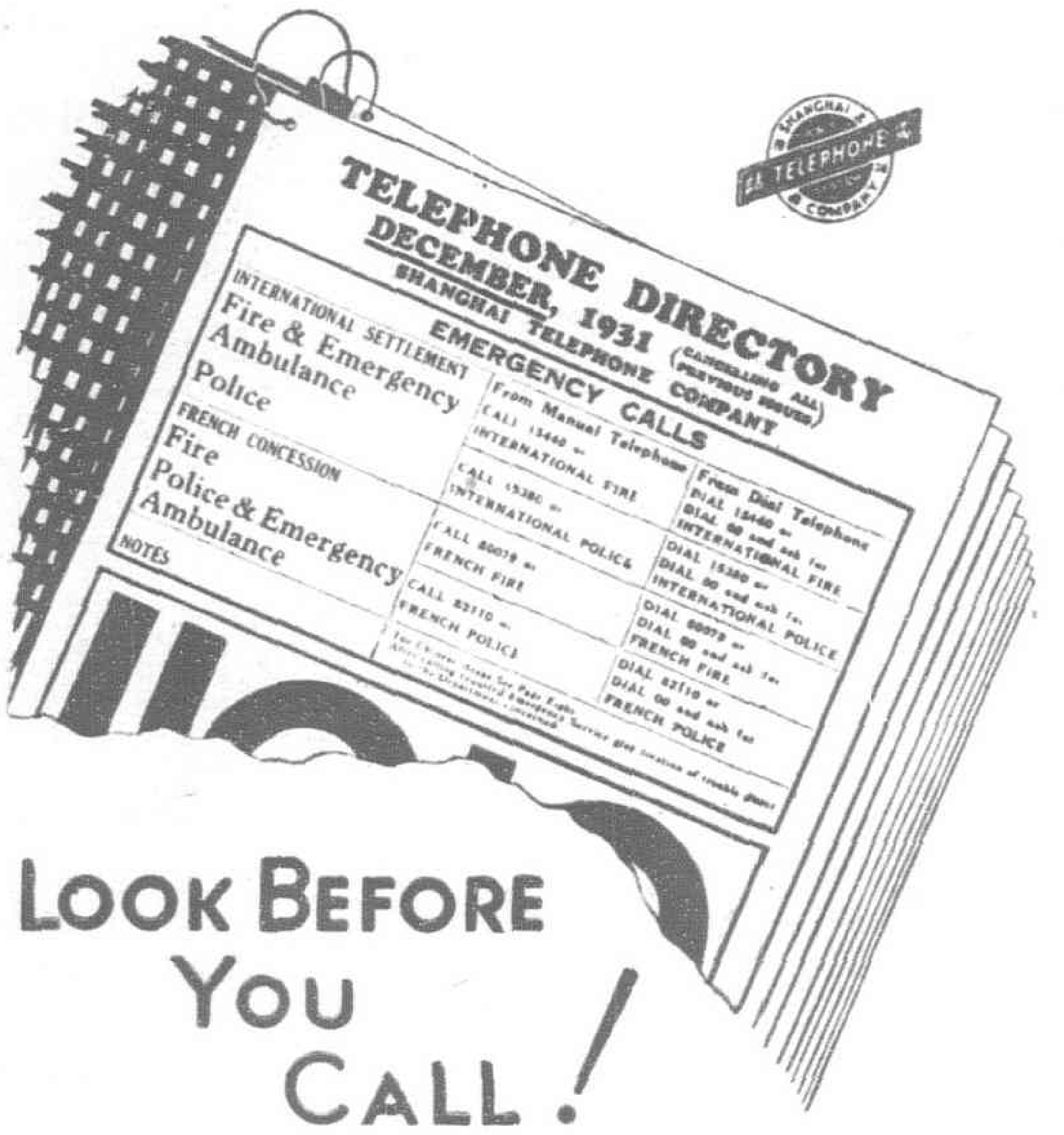
Sole Agents for China: Societe Francaise des Telephones Interurbains
6 Kiukiang Road, SHANGHAI

BOMBAY

Bombay has been included as a regular port of call for all Round the World President Liners, affording a direct fortnightly service from Shanghai to Europe and New York via Hongkong, Manila, Singapore, Penang, Colombo, BOMBAY, Suez, Port Said, Alexandria, Naples, Genoa and Marseilles.

This added attraction will not increase the scheduled time or fares between Oriental and European ports of call.

DOLLAR STEAMSHIP LINES
AMERICAN MAIL LINE



LOOK BEFORE YOU CALL!

THE DECEMBER 1931 DIRECTORY

ABOUT 4,000 times every day requests are made for wrong numbers.

About half of these wrong numbers begin with the figure '6' There are now no such numbers in the Shanghai Telephone System!

Be sure to use only the latest Telephone Directory—illustrated above and marked "December 1931"—and Please Destroy your old Telephone Directories.

SHANGHAI TELEPHONE COMPANY

60 A

BUSS Ltd BASLE
SWITZERLAND

CHEMICAL AND CONSTRUCTIONAL ENGINEERS

Representative for China: R. SCHOEPE, Shanghai, 6 Kiukiang Road, 2nd Floor.

Chemical Plants for processes of every kind;
Extraction Plants for oils and fats, bones, fish, leather, wool, nicotin, etc.
Oil refineries with and without deodorisation.
Extraction - and Concentration - apparatus for tannin substances, dyestuffs, etc.
Impregnating Plants for electric insulating materials plants for preserving wood, etc.
Dryers. Vacuum Dryers. Drum and Roller Dryers.

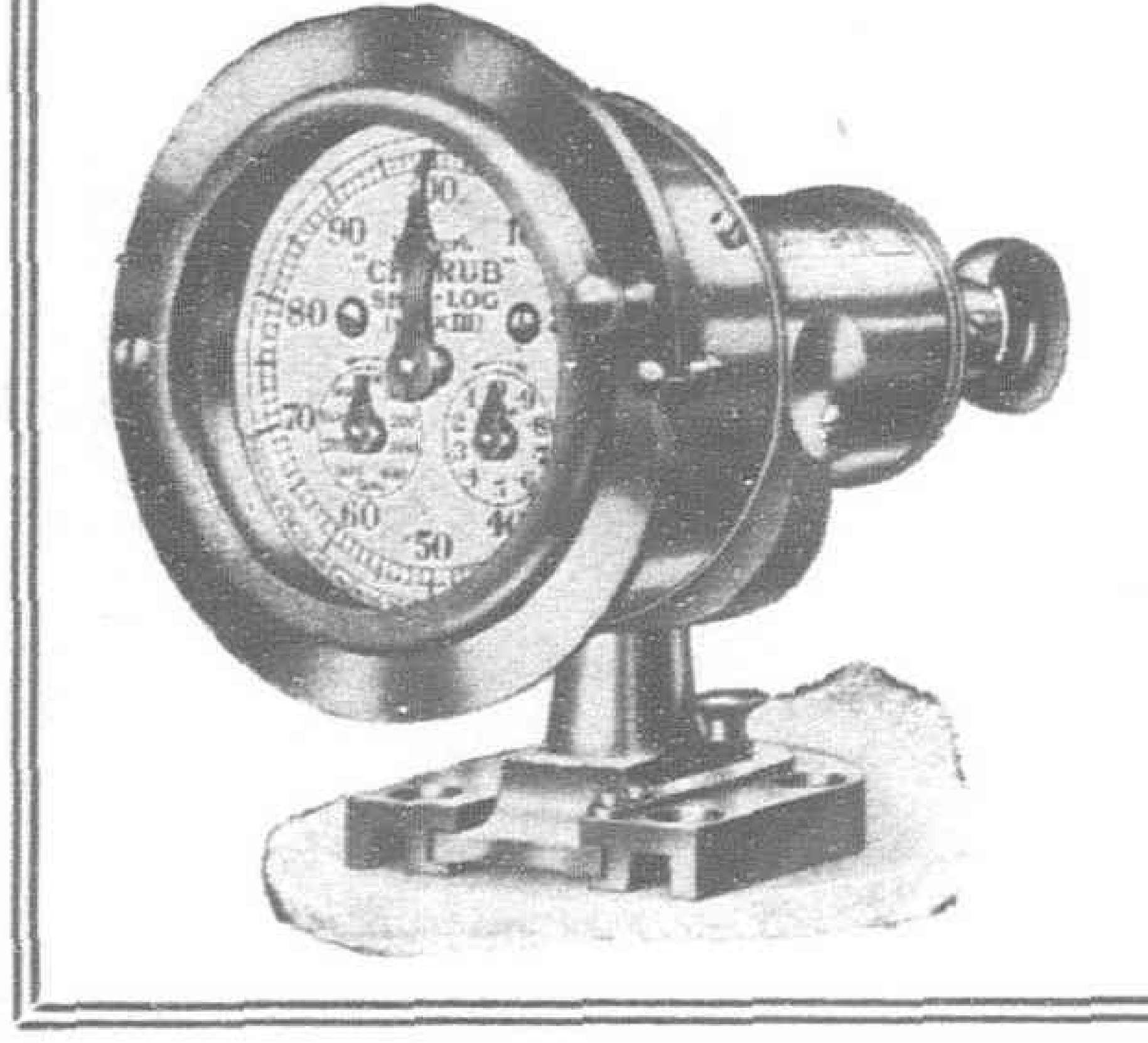
CHEMICAL APPARATUS
AND STEAM BOILERS

(Iron, Steel, Copper, Aluminium, Rustless and Acid-proof Steel)

STEEL STRUCTURAL WORK

Bridges. Weir dams. Foundation-work under compressed air. Girder poles, Tanks. Pipe lines. Cranes—projects and **detail plans with specifications**

Walker's Latest Pattern
"CHERUB" SHIP-LOG
(Mark III)



Accurate and dependable as the former well known model and has the following additional advantages.

1. Will run the longest sea passage with one filling of Walker's Solidified Oil.
2. The mechanism is totally enclosed and is thereby well protected against spray, grit from the funnels and ash dust.
3. Registers up to 1,000 miles.

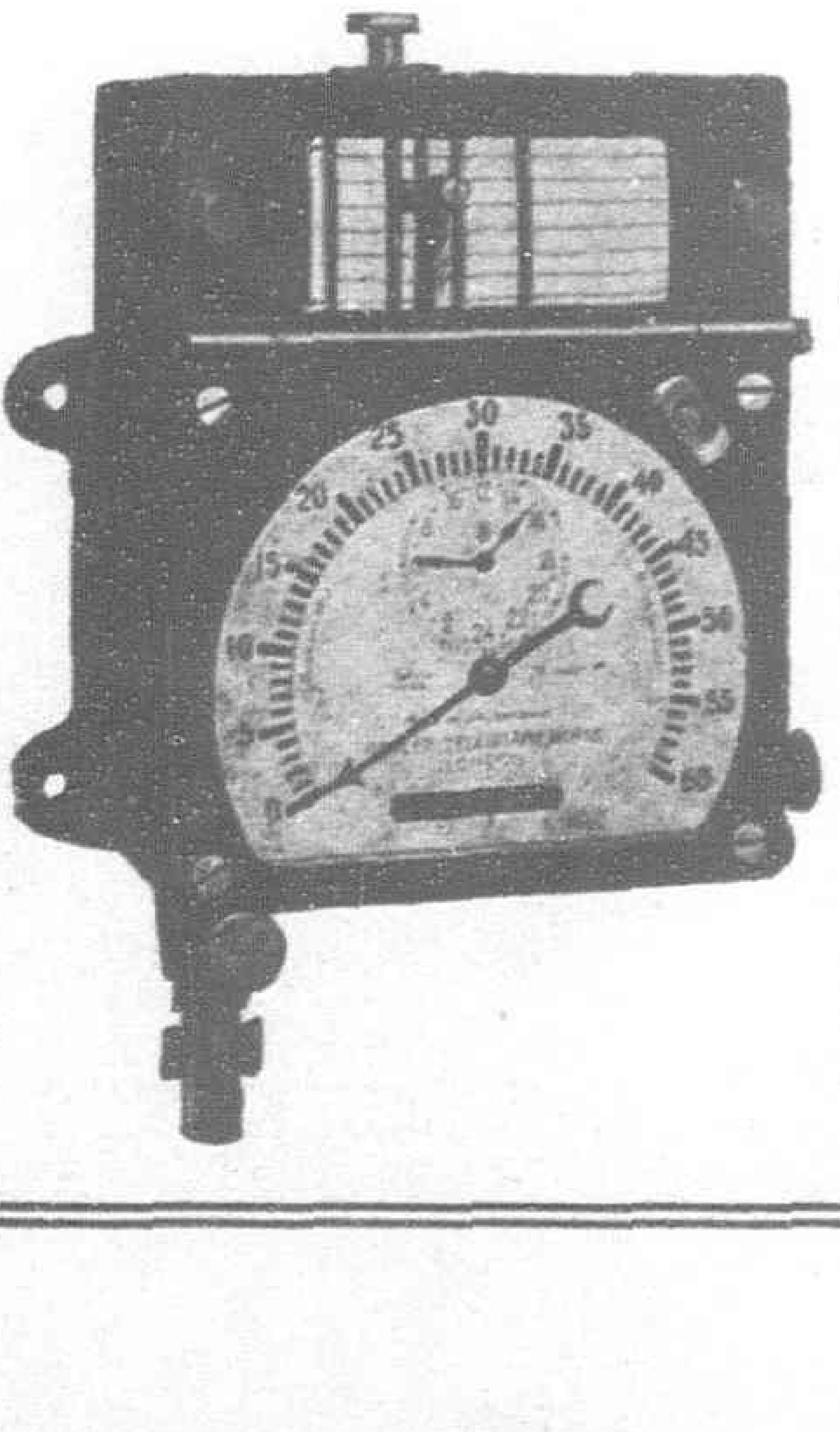
Supplied by all leading Nautical Instrument Dealers.

Thos. Walker & Son, Ltd.,
58, Oxford Street, Birmingham, Eng.
T.W

Modern Sulphuric Acid Plant
Contact and Chamber Process Static Scrubbers
Ammonia—Tar—Benzol and Naphthaline

New System Vacuum Drying for Sulphate Ammonia—Synthetic Ammonia—all Plants for
Chemical By-product Industry, Forced Draught Furnaces for Burning
Slurry and Refuse

The Chemical Engineering and Wilton's Patent Furnace Compamy Limited
76 Victoria Street, London, S.W.1.



THE BEST LOCOMOTIVE SPEED INDICATORS & RECORDERS
WITH CONJUGATE MOVEMENT

TELOC TYPE

Chart Feed on a Mileage Basis of 10 m/m per Mile.

INDICATES:—Speed.
Total mileage since application of Instrument.
Total mileage of each run.
Time of Day in Hours and Minutes.
RECORDS BY SILVER STYLUS:—Speed attained at any point of run.
Time the engine or coach is at work.
Distance covered.
Duration (up to 24 hours) and point of stops.
Time of Day in Hours and Minutes.
If desired apparatus to record working of Westinghouse or Vacuum Brakes.

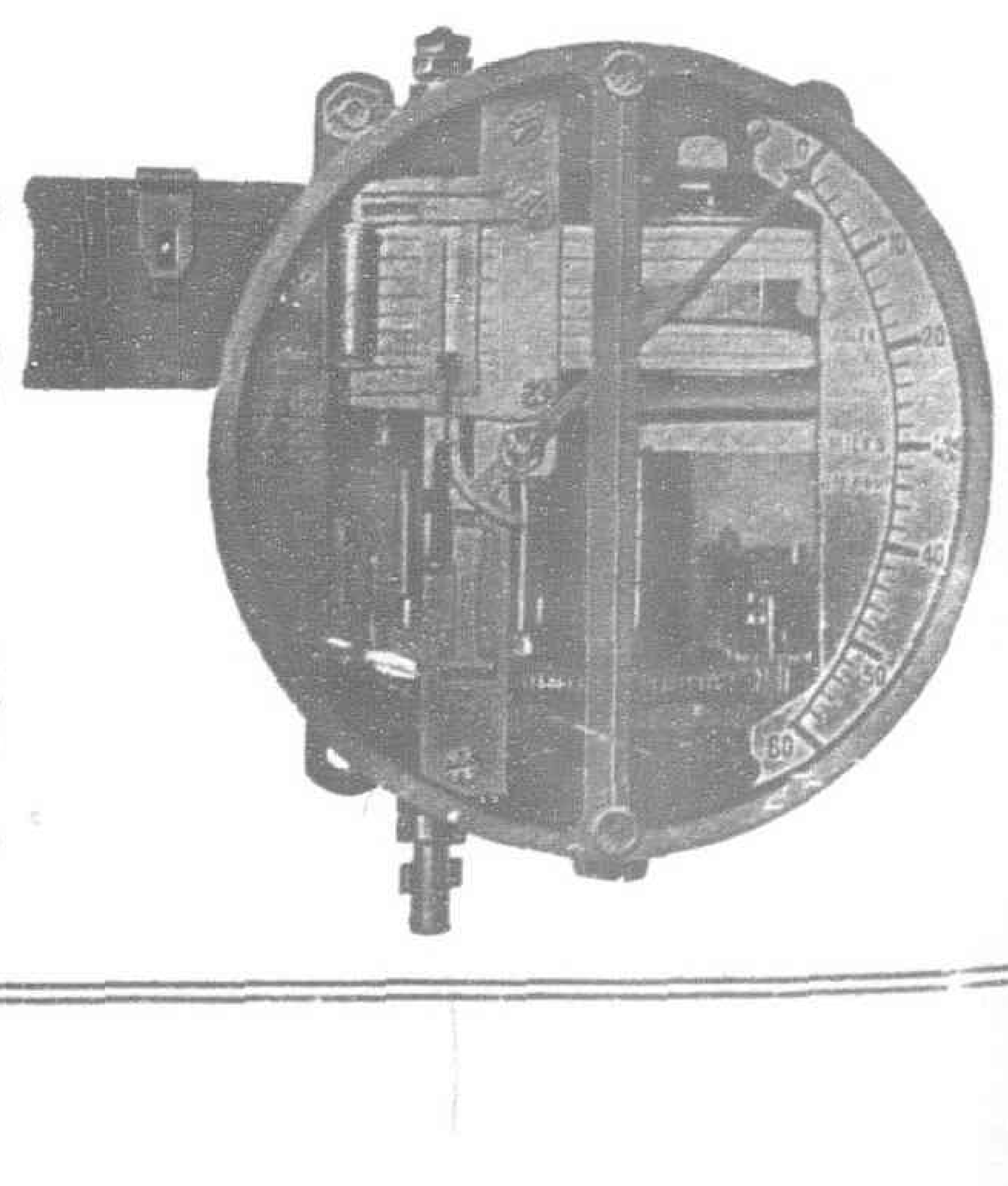
HASLER TYPE

Chart Feed on a Time Basis of 4 m/m per Minute.

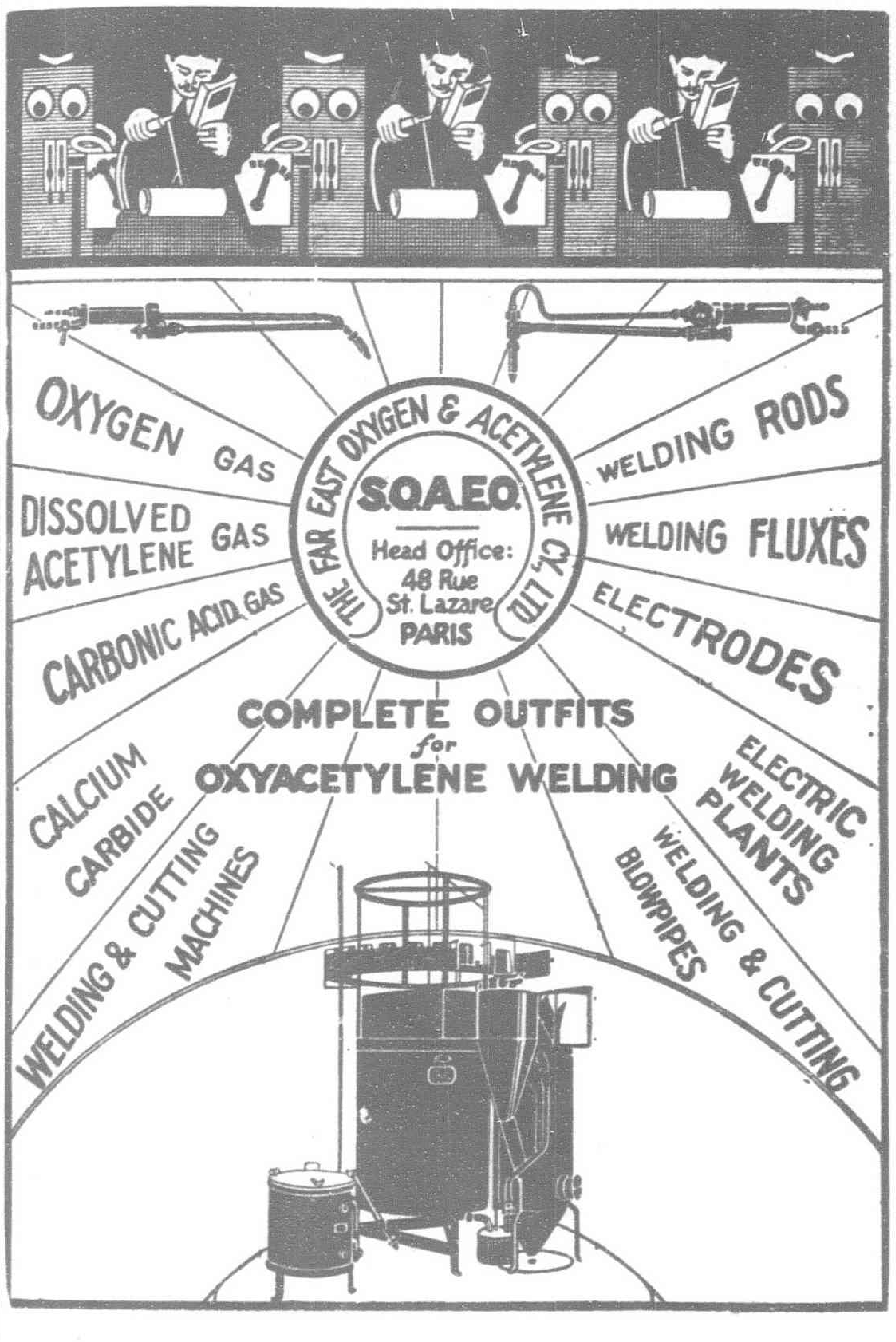
INDICATES:—Speed.
RECORDS BY NEEDLE PUNCTURES:—Speed attained at any point of the run.
Time the engine or coach is at work.
Distance covered.
Duration and point of stops.
If desired bell can be fitted to ring at predetermined speed, or apparatus to record working of Westinghouse or Vacuum Brakes.

HASLER TELEGRAPH WORKS, 26 VICTORIA STREET, LONDON, S.W. 1

Agents in China: WILLIAM FORBES & CO., PEIPING



The Far East Oxygen & Acetylene Cy., Ltd.


OXYGEN GAS
DISSOLVED ACETYLENE GAS
CARBONIC ACID GAS
CALCIUM CARBIDE
WELDING & CUTTING MACHINES
WELDING RODS
WELDING FLUXES
ELECTRODES
ELECTRIC WELDING PLANTS
WELDING & CUTTING BLOWPIPES
THE FAR EAST OXYGEN & ACETYLENE Cy. LTD.
S.O.A.E.O.
Head Office: 48 Rue St. Lazare PARIS
COMPLETE OUTFITS for OXYACETYLENE WELDING

For all orders apply to :

Mr. Jean Rocca

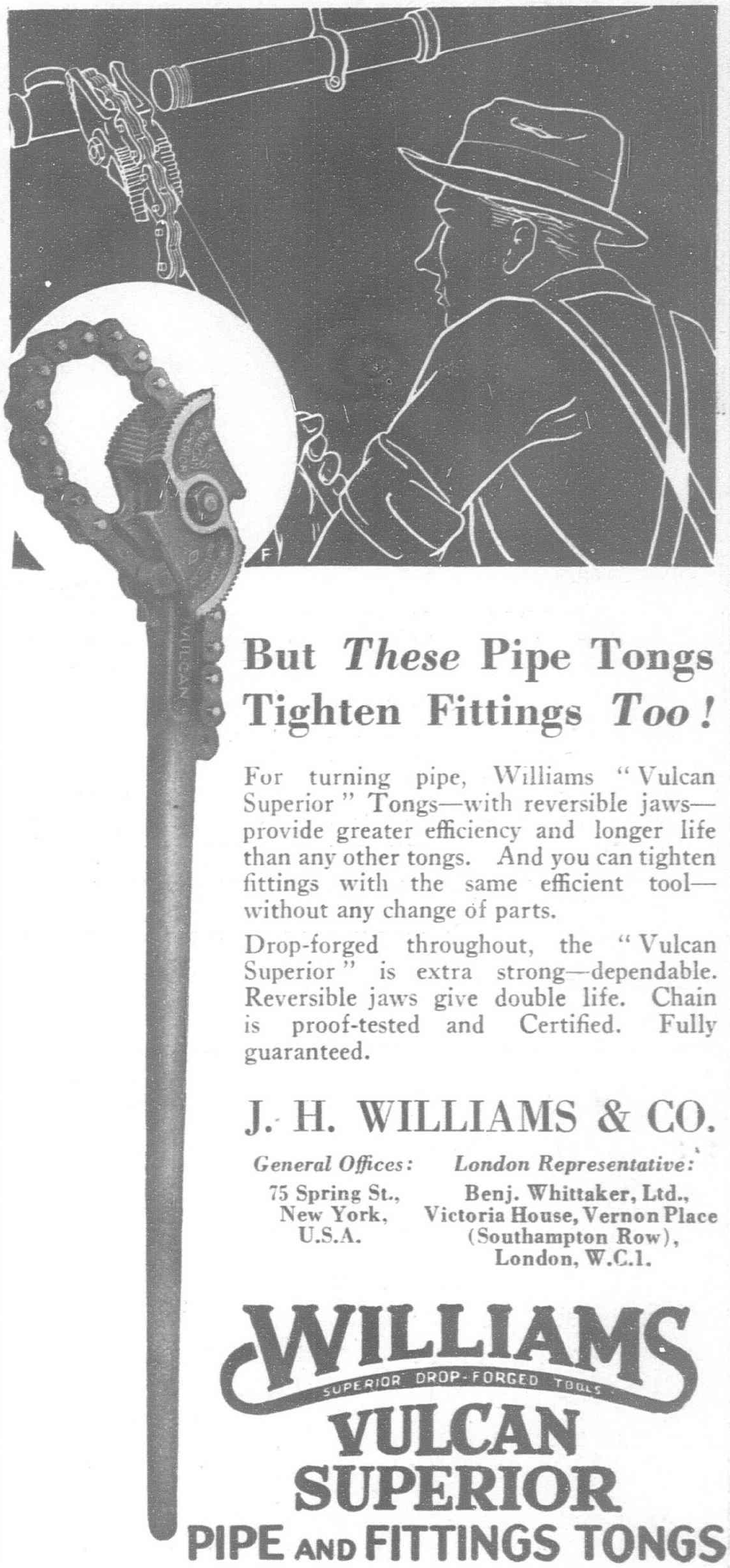
Shanghai's Branch Manager

Office and Factory

200 Route de Zikawei

Telephone: *80064*

Telegraphic Address: "OXYGENE"



But *These* Pipe Tongs Tighten Fittings *Too !*

For turning pipe, Williams "Vulcan Superior" Tongs—with reversible jaws—provide greater efficiency and longer life than any other tongs. And you can tighten fittings with the same efficient tool—without any change of parts.

Drop-forged throughout, the "Vulcan Superior" is extra strong—dependable. Reversible jaws give double life. Chain is proof-tested and Certified. Fully guaranteed.

J. H. WILLIAMS & CO.

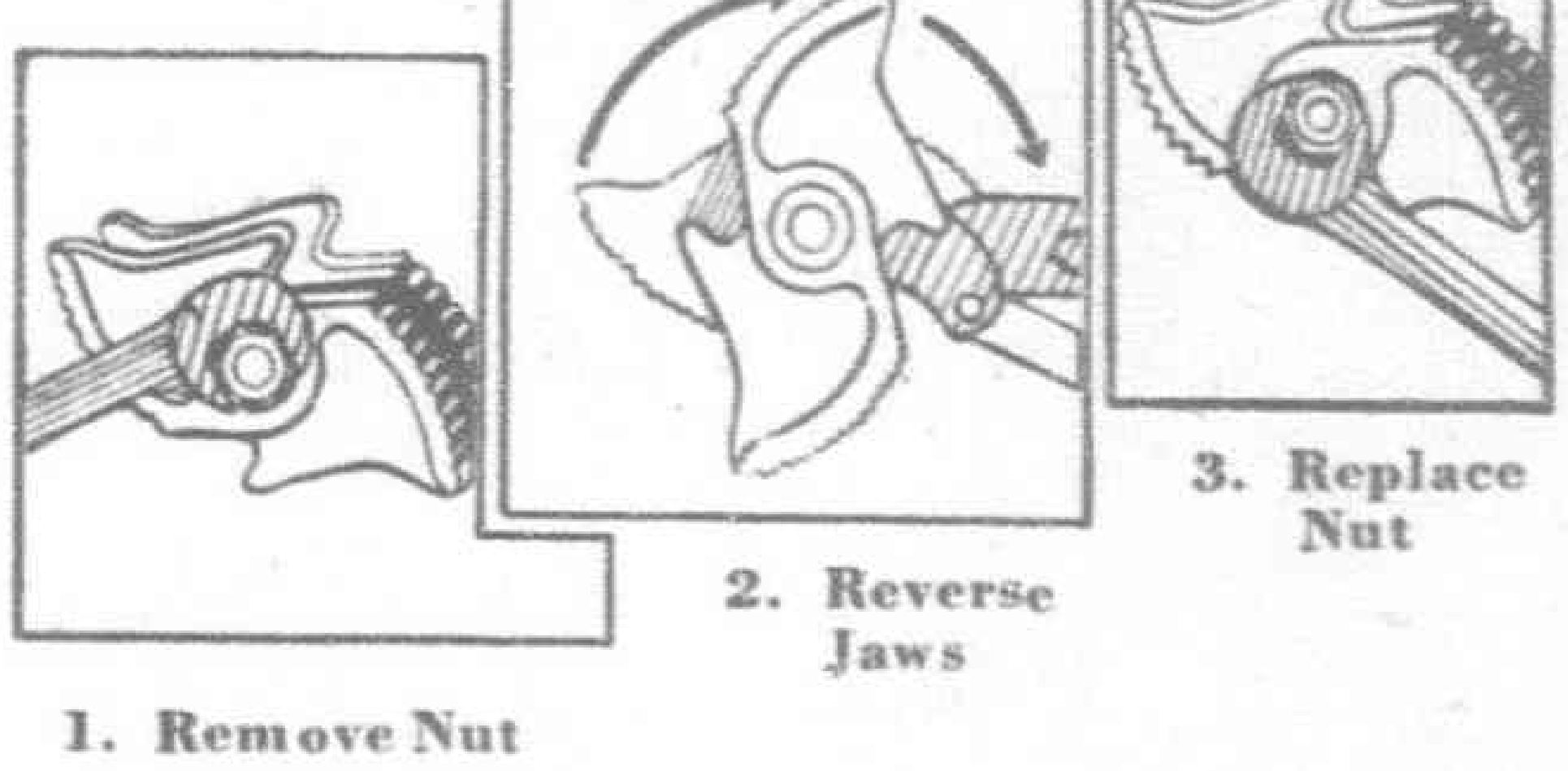
General Offices:
75 Spring St.,
New York,
U.S.A.

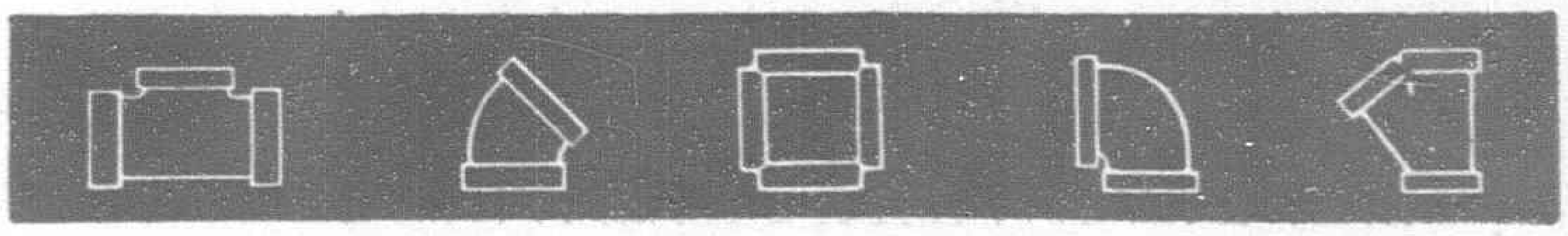
London Representative:
Benj. Whittaker, Ltd.,
Victoria House, Vernon Place
(Southampton Row),
London, W.C.1.

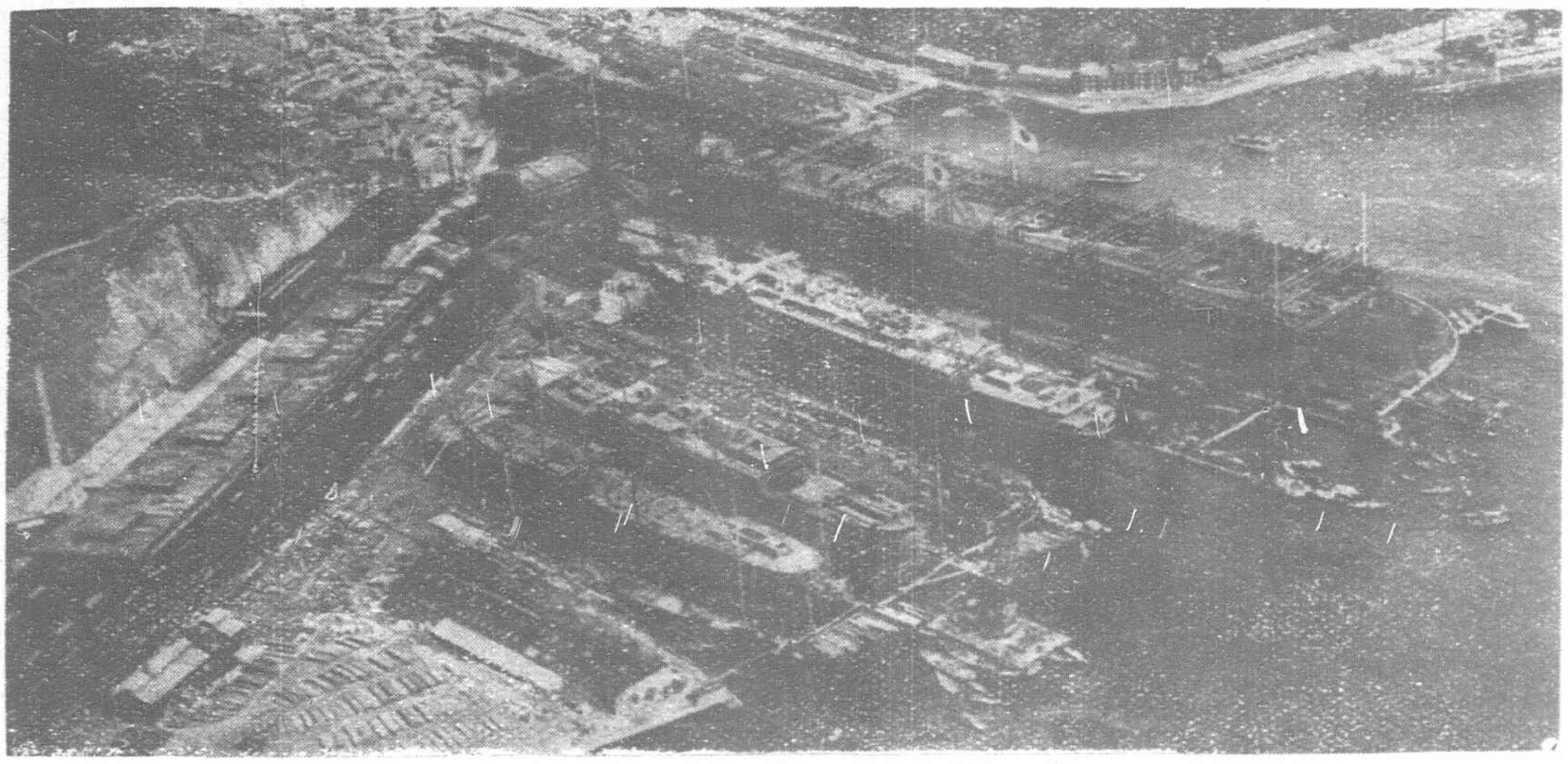
WILLIAMS
SUPERIOR DROP-FORGED TOOLS

VULCAN SUPERIOR
PIPE AND FITTINGS TONGS

Jaws can be reversed in three simple operations!







Aerial View of the Shipyard at Nagasaki

MITSUBISHI ZOSEN KAISHA, LTD., NAGASAKI WORKS

(ex Mitsubishi Dockyard and Engine Works, Nagasaki)

	DOCK No. 1	DOCK No. 2	DOCK No. 3
Extreme Length	523 Ft.	371 Ft.	728.9 Ft.
Length on Blocks	513 ,,	350 ,,	714 ,,
Width of Entrance on Top	89 ,,	66 ,,	99½ ,,
Width of Entrance on Bottom	77 ,,	53 ,,	88½ ,,
Water on Blocks at Spring Tide	26½ ,,	24 ,,	34½ ,,

THE BEST EQUIPPED SHIPBUILDING PLANT IN THE FAR EAST

With Special Facilities for Handling the Heaviest Castings and the Repairing or Building of Ships, Engines and Boilers
Also Electric Work

LARGE STOCK OF MATERIAL AND FITTINGS ALWAYS ON HAND

LEAGUE OF NATIONS

Publication of the International Labour Office

INTERNATIONAL LABOUR REVIEW

The International Labour Review (published monthly) is probably of more general interest than any other International Labour Office publication. It is widely read by those engaged in industry in all countries.

BECAUSE it contains Special Articles by recognised Authorities on all problems connected with the treatment of Labour in Industry :

BECAUSE it summarises all important Reports and Enquiries on labour conditions in all countries, and thus makes their findings easily available in English :

BECAUSE its Statistical Section affords information on Wages, Unemployment, Cost of Living, Migration, etc., on an International basis which is nowhere else available :

BECAUSE its Bibliography is the most complete record of new Labour Laws and new Industrial Publications.

Price: 2s. 6d. or 60 cents per monthly Number. Yearly (post-free) £1 4s. 0d. or $6

Published in the United Kingdom for the International Labour Office
by George Allen and Unwin, Ltd., London.

Obtainable with a free catalogue, from the International Labour Office (League of Nations), Geneva, Switzerland

INTERNATIONAL
LABOUR OFFICE
GENEVA, SWITZERLAND

The National City Bank of New York

1-A KIUKIANG ROAD, SHANGHAI

Head Office :

55 WALL STREET, NEW YORK, U.S.A.

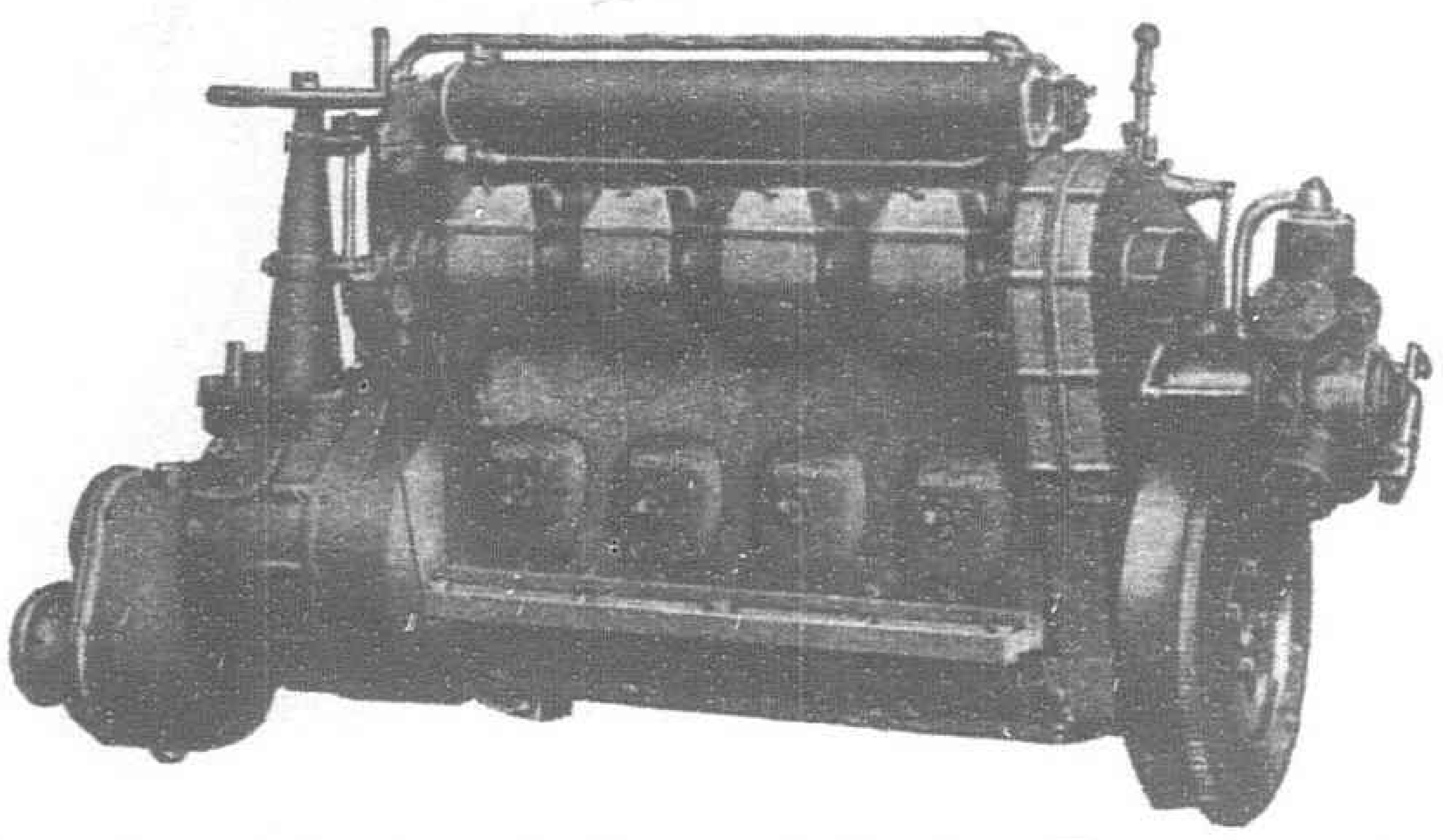
CAPITAL, SURPLUS AND UNDIVIDED PROFITS

U.S. $242,973,145.00

Branches and Affiliates :

ARGENTINE
BELGIUM
BRAZIL
CHILE
CHINA
COLOMBIA
CUBA
DOMINICAN REPUBLIC
ENGLAND
FRANCE
HAITI
INDIA
ITALY
JAPAN
MEXICO
PERU
PHILIPPINE ISLANDS
PORTO RICO
REPUBLIC OF PANAMA
SPAIN
STRAITS SETTLEMENTS
URUGUAY
VENEZUELA

GLENIFFER



60/80 High Speed Four Cylinder Engine with Reverse and Reducing Gear

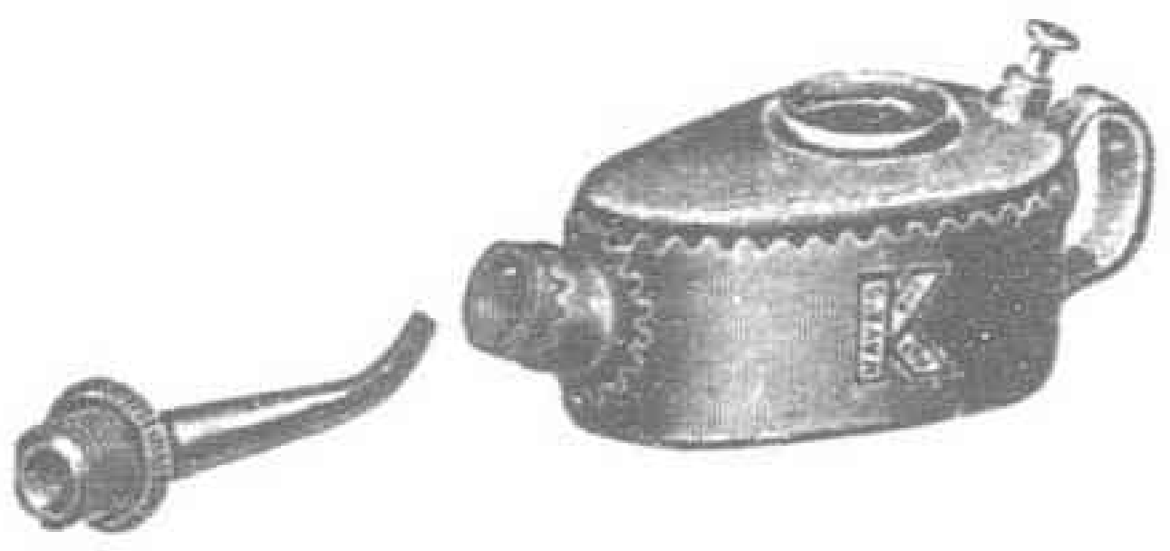
DIESEL TYPE: 45 to 160 h.p.
At 700/900 r.p.m.
In Three, Four, Six and Eight Cylinder Models

PETROL/PARAFFIN TYPE: 7 to 105 h.p.
In Two, Four and Six Cylinder Models

All Models can be supplied with Reducing Gear

Full Particulars from the Manufacturers:
GLENIFFER ENGINES LTD. Anniesland Glasgow, W. 3.
Telegrams: "GLENGINE GLASGOW"
Representative for China:
THE JARDINE ENGINEERING CORPORATION, LTD.
(Incorporated under the Companies Ordinances of Hongkong)
8a Yuen-Ming-Yuen Road, Shanghai

KAYE'S PATENT SEAMLESS STEEL OILFEEDERS, ETC.



Seamless Steel Valve Oilfeeders with Interchangeable Spouts

Write for Complete Catalogue

Seamless Steel Reaper Type Oilfeeders

JOSEPH KAYE AND SONS LTD.
93 High Holborn, London, W.C.1
Works: Hunslet, Leeds Established 1864

FOR SALE

140 *kw. Electric Generating Set.* Vickers-Petters 4-cylinder Diesel Vertical Engine direct coupled to Self paralleling Sandycroft Alternator 140 kw., 440-volts, 3-phase, 50-cycles, at 250 r.p.m. Equipment includes Heenan & Froude Patent Cooler for Jacket Water, Air Compressor and Receivers for starting. This set has only been in service about 6 years and is in first class condition. Reason for sale is that due to extension of the "Grid" System, bulk electricity is now available in the district. For quick sale our price is temptingly low. Apply THE BRITISH STEEL PILING CO., LTD., WORKS CLAYDON, SUFFOLK, ENGLAND.

THE CHEKIANG INDUSTRIAL BANK, LTD.

(MEMBER OF THE SHANGHAI CHINESE BANKERS' ASSOCIATION)

ESTABLISHED 1908

CAPITAL	$2,000,000
RESERVE FUND	$2,000,000
SAVINGS DEPARTMENT—Capital	$200,000
,, ,, —Reserve Fund	$400,000

HEAD OFFICE: 13-14 Hankow Road, Shanghai. *Cable Address:* CHINDUBANK, SHANGHAI.

BRANCHES: Hongkew Sub-branch, 53 Broadway. Hankow Office, Hupeh Road. Hangchow Office, 76-77 Pao Yue Fong.

DOMESTIC AGENCIES: In the principal cities throughout China.

FOREIGN CORRESPONDENTS: ENGLAND: The National Provincial Bank, Ltd., London. UNITED STATES: International Acceptance Bank, Inc., New York. Harriman National Bank, New York. First National Bank of Chicago, Chicago. Bank of Italy, San Francisco. Los Angeles—First National Trust & Savings Bank, Los Angeles. GERMANY: Messrs. M. M. Warburg & Co., Hamburg. Messrs. Hugo Oppenhiem & Sohn, Berlin. FRANCE: Lloyds & National Provincial Foreign Bank, Ltd., Paris. BELGIUM: Lloyds & National Provincial Foreign Bank, Ltd., Brussels. HOLLAND: Rotterdamsche Bankvereeniging, Rotterdam. JAPAN: The Dai Ichi Ginko, Ltd., Tokyo, Yokohama, Kobe, Osaka, Hakodate, Seoul and Fusan.

All Descriptions of General Banking and Exchange, Both Foreign and Domestic, Transacted, Imports and Exports Financed, Bonds and Shares Bought and Sold, Savings Accounts Opened, and Safe Deposit Boxes for Rent.

LI MING, *General Manager.*

Hongkong and Shanghai Banking Corporation

(INCORPORATED IN HONGKONG)

Capital:		
Authorised Capital ...	...	$50,000,000
Issued and fully paid up	...	$20,000,000

Reserve Funds:	
Sterling	£6,500,000
Silver	$10,000,000
Reserve Liability of Proprietors	$20,000,000

Court of Directors

Hon. Mr. C. G. S. MACKIE, Chairman
Hon. Mr. J. J. PATERSON, Deputy Chairman
Hon. Mr. W. H. BELL
A. H. COMPTON, Esq.
G. MISKIN, Esq.
T. E. PEARCE, Esq.
J. A. PLUMMER, Esq.
T. H. R. SHAW, Esq.
J. P. WARREN, Esq.

Head Office:
HONGKONG

Chief Manager:
V. M. GRAYBURN, Esq., Hongkong.

London Bankers:
THE WESTMINSTER BANK, LTD.

Shanghai Branch: 12 The Bund
Sub-Agency: 27 Broadway

Branches and Agencies:

AMOY
BANGKOK
BATAVIA
BOMBAY
CALCUTTA
CANTON
CHEFOO
COLOMBO
DAIREN
FOOCHOW
HAIPHONG
HAMBURG
HANKOW
HARBIN
ILOILO
IPOH
JOHORE
KOBE
KOWLOON (Hongkong)
KUALA LUMPUR
LONDON
LYONS
MALACCA
MANILA
MOUKDEN
MUAR (Johore)
NEW YORK
PEIPING
PENANG
RANGOON
SAIGON
S. FRANCISCO
SHANGHAI
SINGAPORE
SOURABAYA
SUNGEIPATANI
TIENTSIN
TOKYO
TSINGTAO
YOKOHAMA

Interest allowed on Current Accounts and on Fixed Deposits according to arrangement.

Local Bills Discounted. Credits granted on approved Securities and every description of Banking and Exchange business transacted. Drafts granted on London and the chief commercial places in Europe, India, Australia, Africa, China, Japan and America. Safe Deposit Boxes to rent. Terms on application.

SAVINGS BANK OFFICE

Accounts will be kept either in Dollars or Taels, Local Currency, at the option of the Depositor.
Deposits of less than $1 or Tl. 1 will not be received.
Not more than $200 or Tls. 200 will be received during one month from any single Depositor.
Interest at the rate of 3% per annum will be allowed upon the monthly minimum balance.
The maximum balance on which interest will be allowed is $5,000 or Tls. 5,000.
Deposits may be withdrawn on Demand.
Depositors will be provided with Pass Books in which all transactions will be entered. Pass Books must be presented when paying in or withdrawing money.

Office Hours—10 a.m. to 3 p.m. Saturdays 10 a.m. to Noon.

A. S. HENCHMAN, *Manager.*

The Kawasaki-One Hundredth Bank, Ltd.

HEAD OFFICE: YOROZU-CHO, TOKYO

Phone: Nihombashi 141, 3105

SHO HOSHINO, *President*

Special facilities offered for foreign residents and corporations in Japan
Interest allowed on current and time deposits. Safe deposit box rented

BRANCHES AND AGENCIES:

Yokohama, Kobe, Kyoto, Osaka and 78 others in principal cities in Japan

CAPITAL PAID YEN 150,000,000

SUMITOMO GŌSHI-KAISHA

OSAKA, JAPAN

OWNERS OF COPPER MINES, SILVER AND GOLD MINES AND COAL MINES, ETC.

OFFICES AND DEPARTMENTS

Mining Offices	Kohnomai & Ohgayu
Forestry Department	Osaka
Sales Departments	Osaka, Tokyo, Yokosuka, Nagoya, Kobe, Kure, Hakata and Shanghai

The Sumitomo Steel Works, Limited
OSAKA, JAPAN
Capital Subscribed: Yen 12,000,000

The Sumitomo Electric Wire & Cable Works, Ltd.
OSAKA, JAPAN
Capital Subscribed: Yen 10,000,000

The Sumitomo Steel Tube & Copper Works, Ltd.
OSAKA, JAPAN
Capital Subscribed: Yen 15,000,000

The Sumitomo Fertilizer Works, Limited
Capital Subscribed: Yen 10,000,000
Head Office: Osaka, Japan Works: Niihama, Iyo, Japan

The Sumitomo Besshi Mine, Limited
Capital Paid: Yen 15,000,000
Head Office: Niihama, Iyo, Japan Branch: Osaka, Japan

The Sumitomo Warehouse Company, Limited
Capital Paid: Yen 15,000,000
Head Office: Osaka, Japan Branches: Osaka, Kobe & Tokyo

The Sumitomo Trust Company, Limited
Capital Subscribed: Yen 20,000,000
Head Office: Osaka, Japan Branches: Tokyo & Fukuoka, Japan
Authorized to Exercise all Trust Powers for Individuals and Corporations.

The Sumitomo Life Insurance Company, Limited
OSAKA, JAPAN
Capital Subscribed: Yen 1,500,000

The Sumitomo Collieries, Limited
Capital Paid: Yen 15,000,000
Head Office: Osaka, Japan Branches: Wakamatsu & Otaru

ESTABLISHED: 1895 INCORPORATED: 1912

THE SUMITOMO BANK, LTD.

KITAHAMA, OSAKA, JAPAN

Subscribed Capital	Yen 70,000,000
Paid-up Capital	Yen 50,000,000
Reserve Funds	Yen 29,720,000

DIRECTORS:

N. YATSUSHIRO, Esq.	Chairman, Board of Directors and Chief Managing Director
K. KAGA, Esq.	Managing Director
K. OHDAIRA, Esq.	,, ,,
H. OKAHASHI, Esq.	,, ,,
BARON K. SUMITOMO	Director
K. YUKAWA, Esq.	,,
K. HORI, Esq.	,,
M. OGURA, Esq.	,,
S. IMAMURA, Esq.	,,

Home Branches: Osaka, Tokyo, Yokohama, Nagoya, Kyoto, Kobe, Wakayama, Okayama, Onomichi, Niihama, Kure, Hiroshima, Yanai, Shimonoseki, Moji, Kokura, Wakamatsu, Fukuoka, Kurume, Kumamoto.

Offices in Pacific Liners: M. S. "Asama Maru," M. S. "Chichibu Maru," M. S. "Tatsuta Maru."

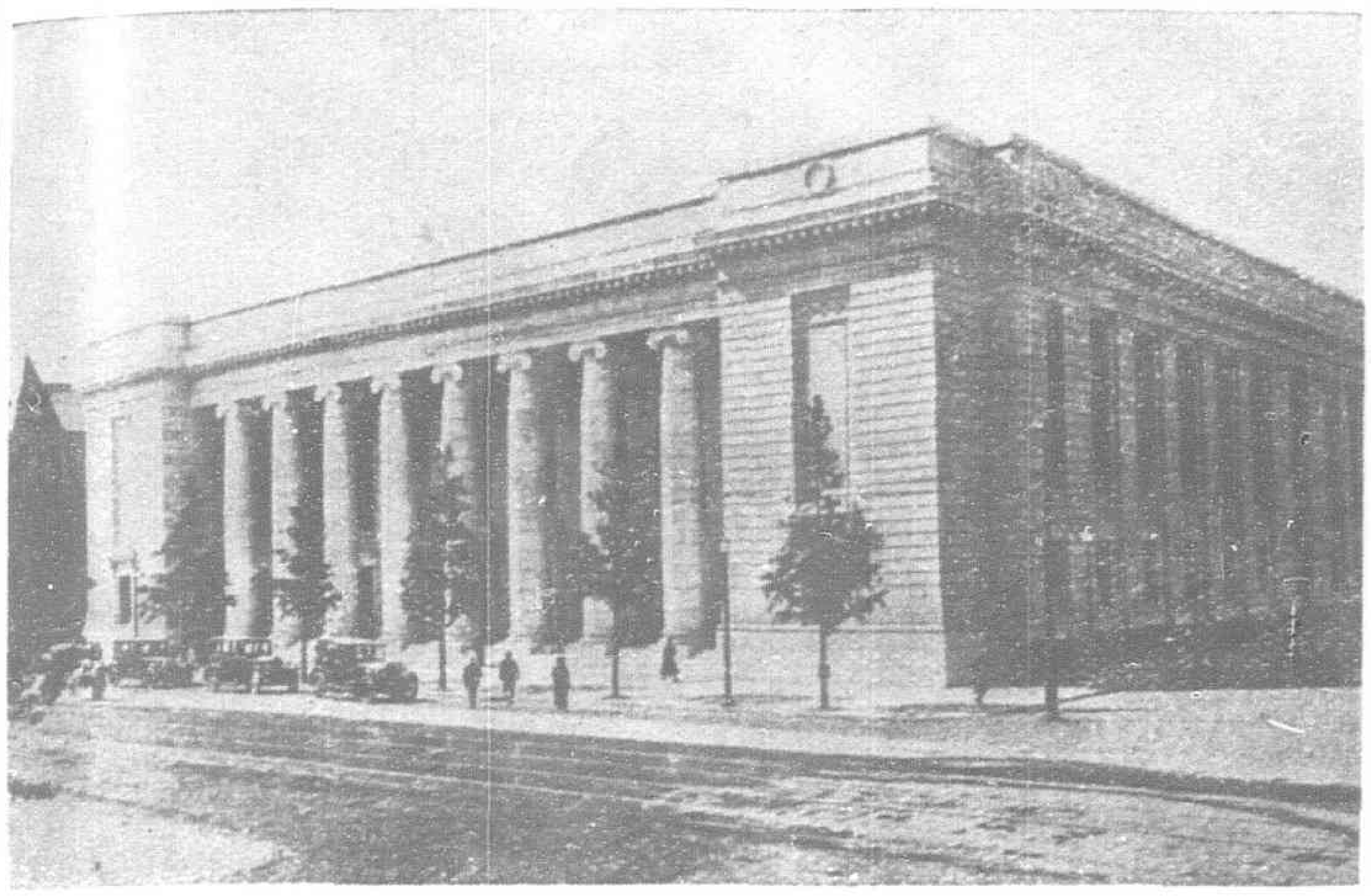
Foreign Branches: London, New York, San Francisco, Los Angeles, Bombay and Shanghai.

Affiliated Banks: The Sumitomo Bank of Hawaii, Honolulu. The Sumitomo Bank of Seattle, Seattle. The Sumitomo Bank of California, Sacramento, Cal.

Bankers: Lloyds Bank, Limited, London. National City Bank of New York, New York. Lloyds and National Provincial Foreign Bank, Limited, Paris.

Correspondents: Established in all important places at home and abroad.

The Bank buys, sells and receives for collection Drafts and Telegraphic Transfers; issues Commercial and Travellers' Letters of Credit available in all important parts of the world, and acts as Trustee for Mortgage Bond, besides doing General Banking Business.



Mitsubishi Bank, Tokyo

THE MITSUBISHI BANK,
LIMITED

CAPITAL - - - - - - Yen 100,000,000
RESERVE FUND - - - Yen 42,050,000

CHAIRMAN:
Mr. Manzo Kushida

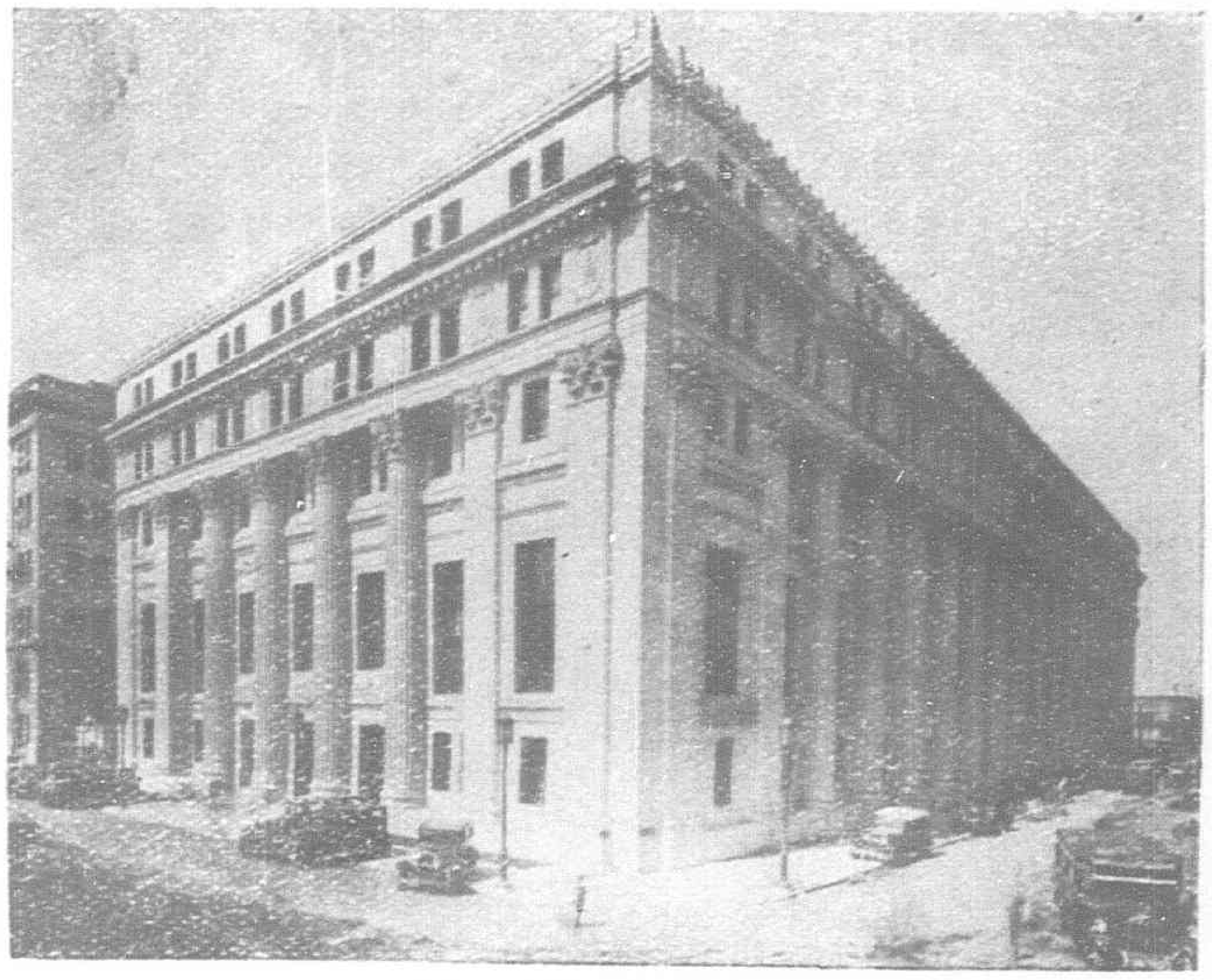
MANAGING DIRECTORS:
Mr. Kiyoshi Sejimo Mr. Takeo Kato
Mr. Sobun Yamamuro

HEAD OFFICE:
No. 5, Marunouchi, Nichome, Kojimachi-ku, Tokyo.

BRANCHES HOME:

Eitaibashi (Tokyo). Tokio Kaijo Building (Tokyo), Marunouchi Building (Tokyo), Nihombashi (Tokyo), Yotsuya (Tokyo), Komagome (Tokyo), Nihombashi-Toricho (Tokyo), Kanda (Tokyo), Shinagawa (Tokyo), Omori (Tokyo), Osaka, Nakanoshima (Osaka), Senba (Osaka), Nishinagahori (Osaka), Kobe, Sannomiya (Kobe), Kyoto, Nagoya, Otaru.

BRANCHES OVERSEAS:
Shanghai Office: No. 2, Kiukiang Road, Shanghai.
London Office: No. 3, Birchin Lane, Cornhill, London, E.C.3.
New York Office: No. 120, Broadway, New York.



Mitsui Bank, Tokyo

THE MITSUI BANK, LTD.

The Oldest Bank in Japan, Founded in 1673

Capital Subscribed............Y. 100,000,000
Capital Paid-Up...................Y. 60,000,000
Reserve Funds.....................Y. 65,200,000

HEAD OFFICE: TOKYO
No. 1 Surugacho, Nihonbashi-ku

Home Branches:

FUKUOKA, HIROSHIMA, KOBE, KYOTO, MARUNOUCHI (Tokyo), MOJI, NAGASAKI, NAGOYA, NIHONBASHI (Tokyo), OSAKA, OSAKA - DOJIMA, OSAKA - KAWAGUCHI, OSAKA - NISHI, OTARU, SHIMONOSEKI, WAKAMATSU (Kyushu), YOKOHAMA.

Foreign Branches:

Bombay, London, New York, Shanghai, Sourabaya.

London Bankers:
Barclays Bank, Ltd. Midland Bank, Ltd.

New York Bankers:
Bankers Trust Co. Chase National Bank.
National City Bank of New York.

BANK OF CHINA

Capital and Reserve $26,000,000
Total Assets $900,000,000

BANK OF PROGRESS

Total Deposits

1925	$259,718,066
1926	$328,481,010
1927	$330,496,947
1928	$387,688,787
1929	$438,096,590
1930	$535,453,153

Head Office:

22 THE BUND, SHANGHAI

Branch Offices throughout China

Overseas Branches :

34 Old Broad St., London, E.C.2.

14 Honta Nibancho, Western District, Osaka.

THE BANK OF TAIWAN, LTD.

Incorporated By
Special Imperial Charter 1899

Shanghai Branch:

No. 16 The Bund
S. Kondo, Manager
Telephones:—Central 1331 (Manager's Office),
8796 to 8800 (Private Exchange to all Departments),
2814 (Compradore's office).

Head Office :

Taipeh Taiwan

Branches and Agencies :

Japan :	Tokyo (Central Office), Kobe, Osaka, Yokohama.
Taiwan :	Giran, Heito, Kagi, Karenko, Keelung, Makong, Nanto, Shinchiku, Taichu, Tainan, Takao, Taito, Tansui, Toen.
China :	Amoy, Canton, Dairen, Foochow, Hankow, Shanghai, Swatow.
Java :	Batavia, Semarang, Soerabaja.
India :	Bombay, Calcutta.
Others :	Hongkong, London, New York, Singapore.

London Bankers:

Barclays Bank, Ltd. Lloyds Bank, Ltd.
Midland Bank, Ltd. Westminster Bank, Ltd.

Correspondents :

Throughout the Principal Cities of the World.

THE YASUDA BANK, LTD.

Head Office: EIRAKU BUILDING, TOKYO.

CAPITAL SUBSCRIBED - - - - - - - - - - - Yen 150,000,000

Chairman of the Board:
Zenjiro Yasuda, Esq.

Deputy Chairman:
Hirozo Mori, Esq.

Managing Directors:
Hisashi Hyosu, Esq.
Hisomu Sonobe, Esq.
Junzo Saito, Esq.
Yuzo Hamada, Esq.

The Bank is now in command, not only of 140 Branches in Japan, but also of the services which it has secured from many correspondents throughout the world, and is able to offer accommodation for every kind of banking facilities, foreign and domestic.

Foreign Business:
TOKYO HEAD OFFICE
YOKOHAMA OFFICE, Honcho
OSAKA OFFICE, Koraibashi
KOBE OFFICE, Sakaemachidori

BANK OF COMMUNICATIONS

Established in 1908

Capital: $10,000,000.00 **Reserve Fund: $2,167,857.39**

Under the Special Charter of the National Goverment
as

THE BANK

to Develope National Industry, Commerce, Agriculture and Mining
Branches all over China
Correspondents in all Important Cities in Foreign Countries

EVERY DESCRIPTION OF BANKING BUSINESS TRANSACTED

Interest Allowed on Deposits According to Arrangement

Head Office: 1A HANKOW RD., Shanghai
General Manager: T. D. Woo

Shanghai Office: 14 THE BUND
Manager: Z. C. Zing

MITSUBISHI MARINE AND FIRE INSURANCE CO., LTD.

(Mitsubishi Kaijo Kasai Hoken Kabushiki Kaisha)

Underwriters for

Marine, Fire, Transport, Automobile, Burglary and Personal Accident Insurances of every Description

Head Office:
MARUNOUCHI, TOKYO

Cable Address:
"INSURER"

CAPITAL - - - - - - -	Yen 5,000,000
RESERVE FUND - - - - -	,, 12,380,000

Branches and Agencies:

LONDON, NEW YORK, OSAKA, KOBE, SHANGHAI, AND OTHER IMPORTANT CITIES AND PORTS OF THE WORLD

MITSUBISHI TRUST CO., LTD.

Subscribed Capital - - -	**Yen 30,000,000**
Paid-up Capital - - - - -	**,, 7,500,000**

***Chairman*:**

Mr. Kenkichi Kagami

***Managing Directors*:**

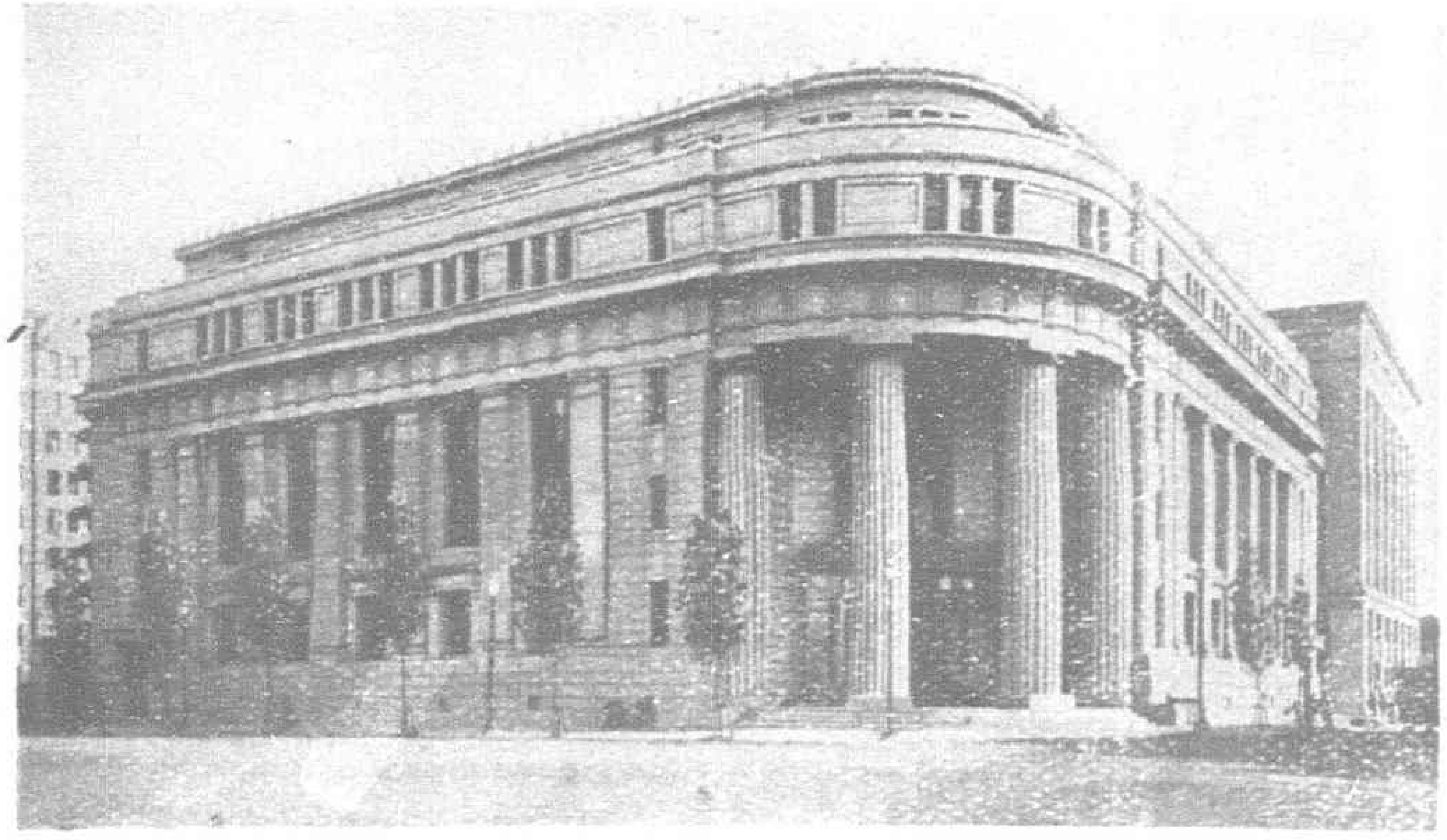
Mr. Hidemi Tamura Mr. Yasuichi Miyagawa

***Head Office*:**

No. 6 Marunouchi, Nichome, Kojimachi-ku, Tokyo.

***Branch Office*:**

No. 1 Sozecho, Kita-ku, Osaka.



The Dai-Ichi Ginko, Ltd., Tokyo

THE DAI-ICHI GINKO, LTD.

(FORMERLY THE FIRST NATIONAL BANK)
ESTABLISHED 1873

Capital (Paid up) - - - -	Yen 57,500,000.00
Reserve Fund - - - - -	Yen 57,500,000.00
Special Reserve Fund - - -	Yen 7,950,000.00

President : K. ISHII.

Directors :

S. SUGITA, Y. OHSAWA, T. AKASHI, Y. NOGUCHI, K. NOGUCHI, K. SHIBUSAWA, T. KANOH, J. TANAKA.

Adviser :

Y. SASAKI.

HEAD OFFICE:

No. 1, 1-chome, Marunouchi,
KOJIMACHI-KU, Tokyo.
S. KODAIRA, *Manager*.

CITY BRANCHES:

Akasaka, Asakusa, Azabu, Fukagawa, Ginza, Gofukubashi, Hibiya, Hongo, Honjo, Horidome, Kabutocho, Kanda, Komagata, Kyobashi, Marunouchi, Mita, Muromachi, Osaki, Sanya, Setomoncho, Shibaya, Shinjuku, Ushigome.

HOME BRANCHES:

Ashikaga, Fukuoka, Fushimi (Kyoto), Gojo (Kyoto), Hakodate, Hiroshima, Honmachi (Osaka), Hyogo (Kobe), Imabashi (Osaka), Kiryu, Kobe, Kokura, Kumamoto, Kurume, Kyomachi (Kobe), Kyoto, Marutamachi (Kyoto), Minamiku (Osaka), Moji, Muroran, Nagoya, Nishijin (Kyoto), Nishiku (Osaka), Osaka, Otaru, Sano, Sapporo, Shimonoseki, Shinsaibashi (Osaka), Tamayacho (Nagoya), Tatebayashi, Tochigi, Toyohashi, Utsunomiya, Yokkaichi, Yokohama.

BRANCHES IN KOREA:

FUSAN, SEOUL.

LONDON & NEW YORK AGENTS:

London :	Westminster Bank, Ltd., Midland Bank, Ltd., The Yokohama Specie Bank, Ltd.
New York :	The National City Bank of New York, The Guaranty Trust Co. of New York, The Yokohama Specie Bank, Ltd.

CORRESPONDENTS:

The Bank, in addition to its own Branches, has numerous Agencies or Correspondents in the principal Cities and Towns at Home and Abroad.

The Bank of Chosen

Capital Subscribed - - - Yen 80,000,000
Capital Paid-up - - - Yen 50,000,000

Governor: K. Nonaka, Esq.
Deputy-Governor: S. Suzuki, Esq.

Directors:

Y. Katayama, Esq. M. Hashimoto, Esq
I. Iuchi, Esq. T. Kakiuchi, Esq.

Head Office: SEOUL (Korea)

FOREIGN DEPARTMENT (TOKYO)

(All communications relating to correspondence arrangements and the Bank's general foreign business to be addressed to the Foreign Department)

Branch Offices:

Japan Proper—Tokyo, Osaka, Kobe, Shimonoseki

Korea—Chemulpo, Pyengyang, Fusan, Wonsan, Taiku, Chinnampo, Kunsan, Mokpo, Hoilyong, Chungjin

Manchuria—Antung, Mukden, New Town (Mukden), Dairen, Yingkow (Newchwang), Changchun, Harbin, Tiehling, Liaoyang, Ryojun, Kaiyuan, Chengchiatun, Szupingchieh, Fuchiatien, Kirin, Lungchingtsun

China Proper—Shanghai, Tientsin, Tsingtao, Tsinan

Siberia—Vladivostok, Alexandrofsky Port

NEW YORK AGENCY:

**G. Benenson Investing Building, 165 Broadway,
New York City**

LONDON REPRESENTATIVE:

**Palmerston House, 34 Old Broad Street,
London, E.C. 2**

Correspondents:

San Francisco, Seattle, New York, London, Paris and in Other Commercial Centers throughout the World

---

Industrial Bank of Japan,
Limited

(NIPPON KOGYO GINKO)

Established by the Japanese Government by virtue of a Special Enactment of Imperial Diet

Capital Subscribed - - - Yen 50,000,000

Head Office: 8, 1-chome Marunouchi, Tokyo.
Cables: "Kogin," Tokyo

BRANCHES:

Tokyo: Nihonbashi *Osaka:* Koraibashi
Kobe: Nakamachi *Nagoya:* Minaminagashima-cho

TOYOTARO YUKI, Esq., *President*

DIRECTORS:

Ichimatsu Horai, Esq. Taro Kimimori, Esq.
Koichi Kawakami, Esq.

AUDITORS:

Teizo Iwasa, Esq., Viscount Takamasa Hachijo
Naoichi Tanaka, Esq.

All descriptions of general banking, exchange, both foreign and domestic, and trust and corporation financial business transacted.

Correspondents in the principal cities at home, and in London, Paris, New York, and San Francisco.

Business Transacted:

1.—Loans on the security of public bonds, of debentures and shares, estates (Zaidan), specified land and buildings.
2.—Subscription and underwriting public bonds or debentures.
3.—Deposits and safe custody of valuables.
4.—Trust company business.
5.—Discounting of bills.
6.—Foreign exchange business.
7.—Other banking business sanctioned by the Minister of State for Finance in accordance with Law of Ordinance.

National Government of China

MINISTRY OF RAILWAYS

PURCHASING COMMISSION

Shanghai Office:
NORTH STATION, NANKING-SHANGHAI RAILWAY

THE Ministry of Railways announces the organization of the Purchasing Commission, which will act as a CENTRAL PURCHASING AGENCY for the Government Railways under the control of the Ministry of Railways.

The Purchasing Commission welcomes Quotations, Specifications, Samples, etc. for Locomotives, Cars, Steel Rails and all Railway Materials.

Chinese National Railways

NANKING-SHANGHAI

AND

SHANGHAI-HANGCHOW-NINGPO LINES

A service of well equipped Express and Fast Trains on each Line, combined with the most picturesque scenery and good shooting areas, makes the places they reach very attractive to Tourists and Sportsmen.

TAKE A TRIP TO "SOO" AND "HANG" (SOOCHOW AND HANGCHOW) WELL KNOWN AS THE PARADISE OF THE FAR EAST.

The wonderful Pagodas (one of the specialties of China), ancient Royal Tombs and historical Monuments, etc., along these two Lines are well worth a visit.

Reduced Rates for Picnic Parties.

75% Rate Excursion Return Tickets for Hangchow.

For further particulars, intending passengers are requested to apply to:

THE TRAFFIC MANAGER,

Tel. No. 43199.

SHANGHAI-NORTH STATION

See China's Holy Land!

Via the

Tientsin-Pukow (Tsinpu) Railway

The next time you travel northward take the overland route. Go the "Tsinpu way" through the land of Confucius, and get a glimpse into the spiritual heart of Cathay. No jaded tourist trail this—it is an adventure comparatively few have enjoyed.

In many respects the Tientsin-Pukow is the most important railway in China. In conjunction with the Shanghai-Nanking Railway on the south, and the Peping-Mukden line in the north, the Tientsin-Pukow Railway joins the former capital and the cultural centre of the country with the new capital, Nanking, and, two hundred miles beyond, with the nation's greatest seaport, Shanghai.

On the Tsinpu route you will travel through some of China's richest provinces: Shantung, Anhui, Chihli and, wealthiest of all, Kiangsu. In general it follows the line of communications which for centuries has been the principal link between the Imperial City of the north and the great producing areas of the lower Yangtze valley, a line marked by the Grand Canal, over whose waters the bulk of the tribute of the southern provinces for scores of generations flowed into the Emperors' treasuries in the north. It traces almost the path of Marco Polo, that which he used when he went down from Peping to Yangchow, in the province of Kiangsu, to become a magistrate under the great Kublai Khan.

You will pass through the most ancient portions of the Chinese Empire, including the district which has been called "The Holy Land of China," that part of western Shantung in which Confucius was born, taught and died, leaving a spirit which profoundly has influenced Asiatic culture for longer than Christ has been diefied in the West. Here also is the region in which Mencius, the great interpreter of the Sage, carried on his work. And you will see Tai Shan, the most famous sacred mountain in China, upon whose summit civilized men have worshipped for more than four thousand years.

These are but a few of the attractions that will fascinate you along the Tsinpu road to Peping. Trains leave Pukow daily for the north: diners, sleepers, chair cars. For further information as to rates, schedules, accommodations, etc., apply to:

THE TIENTSIN-PUKOW RAILWAY

HEAD OFFICE, PUKOW

This advertisement issued by the Chinese Government Railway Administration

THE WORLD'S GAZE

TURNS

POLITICALLY, ECONOMICALLY, ARTISTICALLY

TOWARDS

JAPAN

WHERE

Oriental charms are jealously preserved intact amidst the most advanced Oriental civilization

TOURISTS ARE ASSURED

OF

Comfort, Convenience and Safety

TWO MOST RELIABLE ORGANIZATIONS FOR TRAVELLERS

1. **JAPAN TOURIST BUREAU**
   Head Office: Tokyo Station, Tokyo, Japan
2. **JAPAN HOTEL ASSOCIATION**
   c/o Traffic Bureau, Japanese Government Railways

JAPANESE GOVERNMENT RAILWAYS

STEAM and ELECTRIC

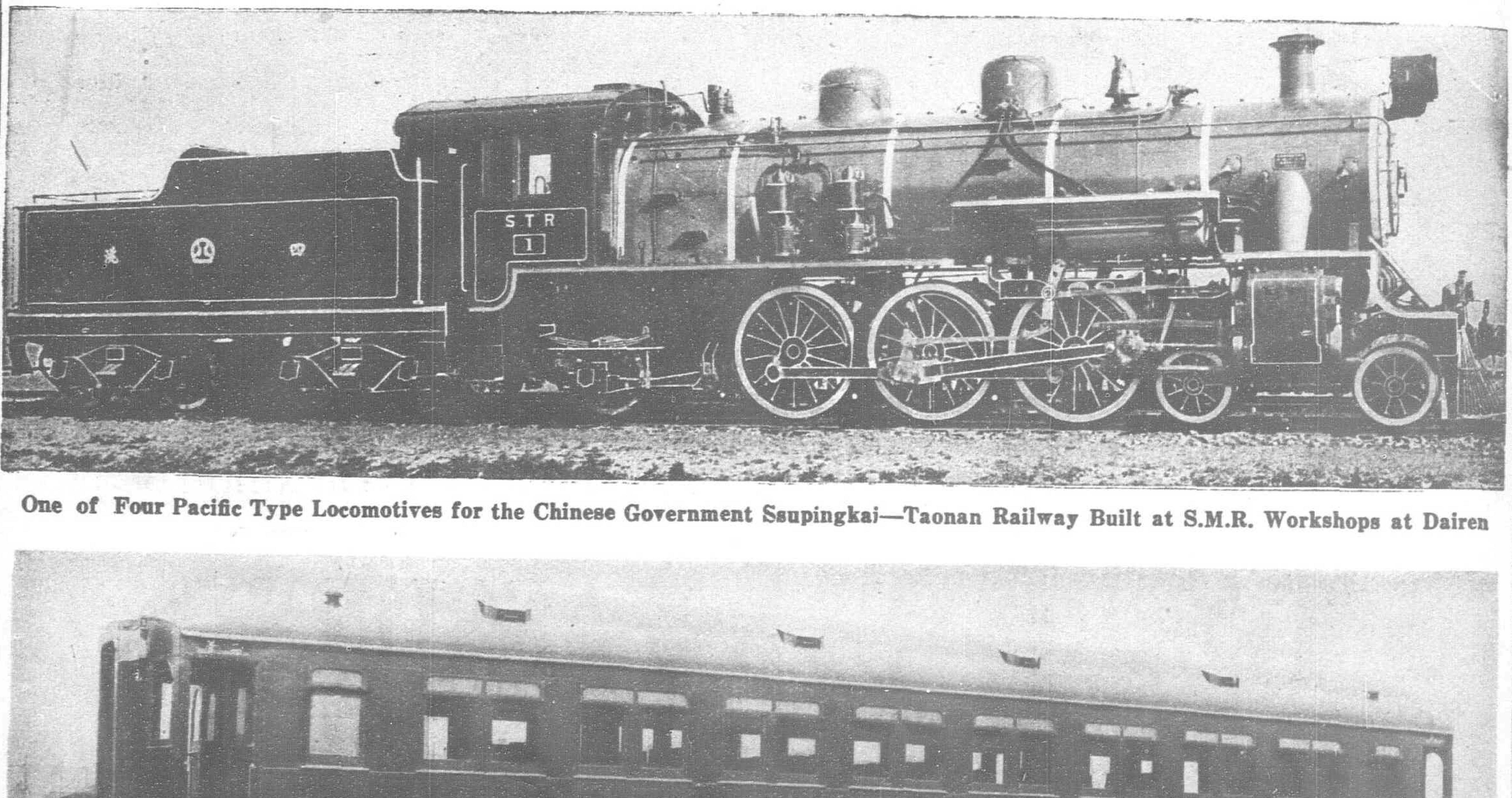
LOCOMOTIVES

WOODEN and ALL-STEEL

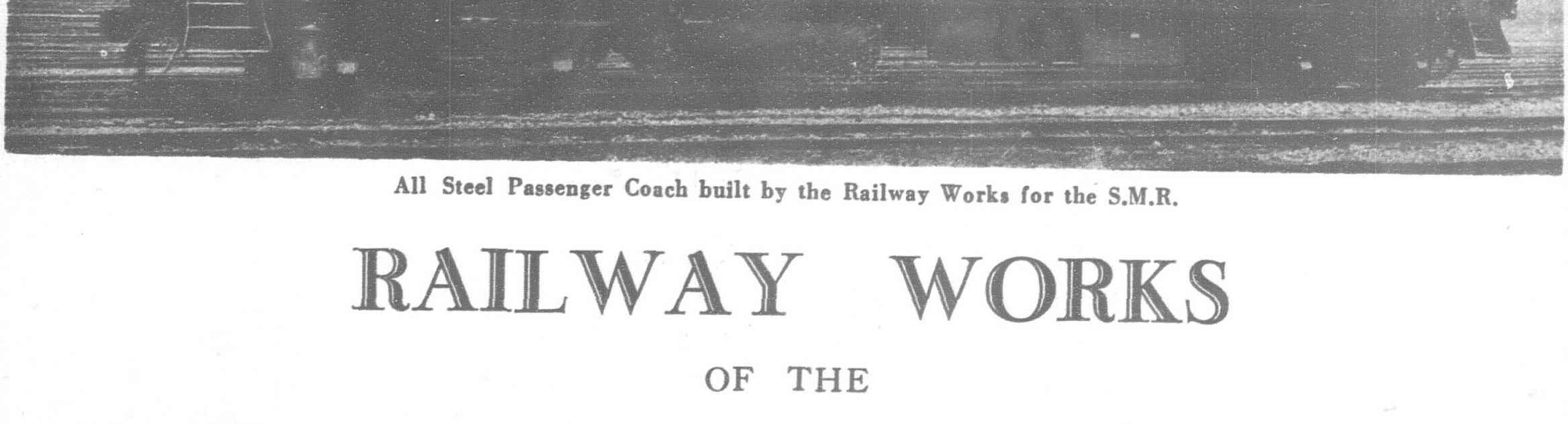
PASSENGER and FREIGHT CARS

CAST IRON PIPE and FITTINGS

UP TO ONE METER DIAMETER



One of Four Pacific Type Locomotives for the Chinese Government Ssupingkai—Taonan Railway Built at S.M.R. Workshops at Dairen



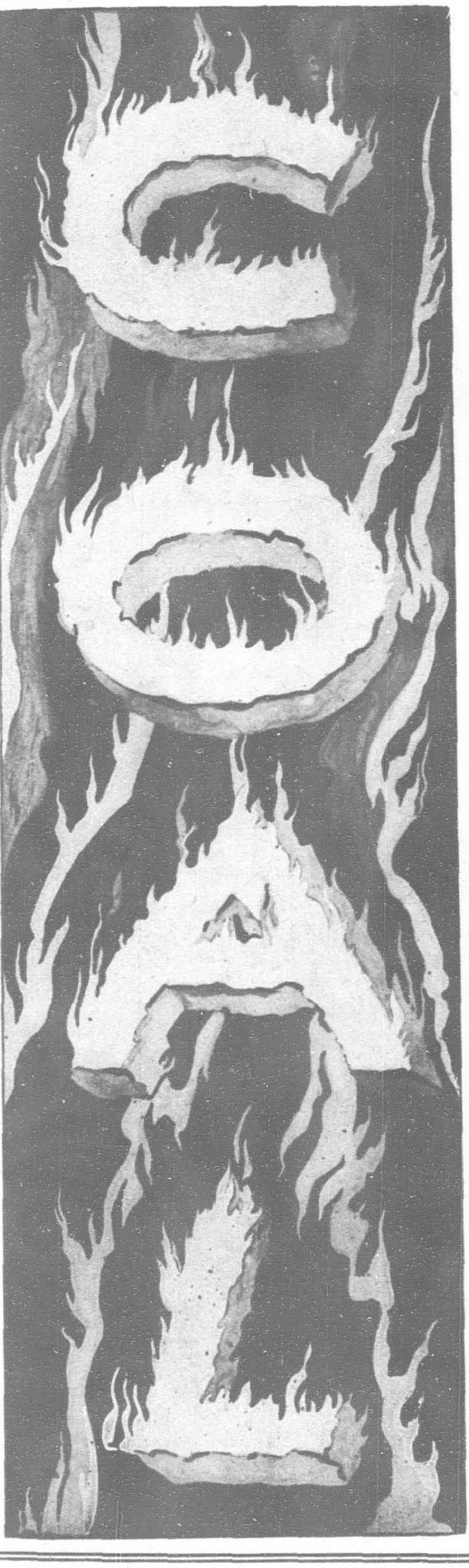
All Steel Passenger Coach built by the Railway Works for the S.M.R.

RAILWAY WORKS

OF THE

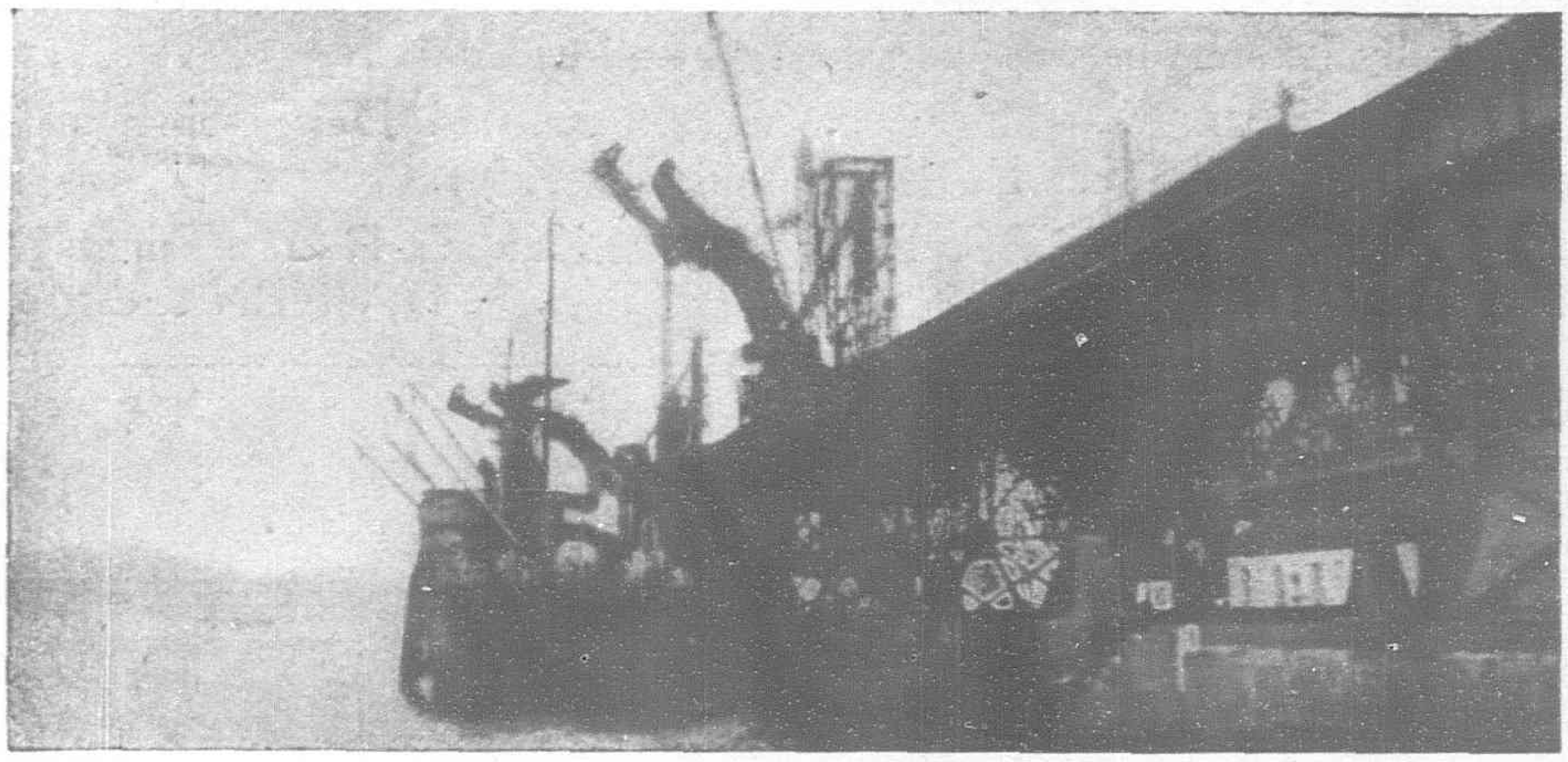
SOUTH MANCHURIA RAILWAY CO., DAIREN

FUSHUN



THE BEST STEAMING COAL IN THE FAR EAST

OUTPUT OF MINES, 8,200,000 TONS


Steamer loading coal at the coal pier, Kanchengtzu

A new coal pier handling 3,800,000 tons of coal for Export and Bunker Supply is now in operation at Kanchengtsu, across the bay from Dairen. Four 8,000 ton vessels can be accommodated at one time and loaded by boom conveyors at the rate of 900 tons per hour from each conveyor. A coal storage yard with a capacity of 3,000,000 tons guarantees quick dispatch.

Depots : Dairen, Port Arthur, Newchwang, Tientsin, Tsingtau, Tsurumi

Agencies : Chefoo, Manila, Batavia, South Seas, Moji, Takao (Formosa) Nagoya, Shanghai, Sourabaya, Singapore, Osaka, Hongkong, Penang, Yokohama, Niigata

Also Sulphate of Ammonia, Fire Clay, and Talc

Pamphlets and Particulars gratis from any of the above Depots and Agencies, and from the

MINING DEPARTMENT :

South Manchuria Railway Company, Dairen

SOUTH MANCHURIA RAILWAY

Quickest, Best, and Most Direct Route in the Tokyo-Peping-Harbin-Shanghai Directions

MAIN LINE Dairen to Changchun, via Mukden. Antung to Mukden
BRANCH LINES Dairen to Port Arthur, Tashihchiao to Yingkou (Newchwang), Hunho to Fushun

CONNECTIONS:

AT CHANGCHUN:—Chinese Eastern Railway for the Great Trans-Siberian Route (7 hours and a half only by Express between CHANGCHUN and HARBIN).

AT CHANGCHUN:—Kirin-Changchun Line of the Chinese Government Railways (3 hours and a half only by Express between CHANGCHUN and KIRIN).

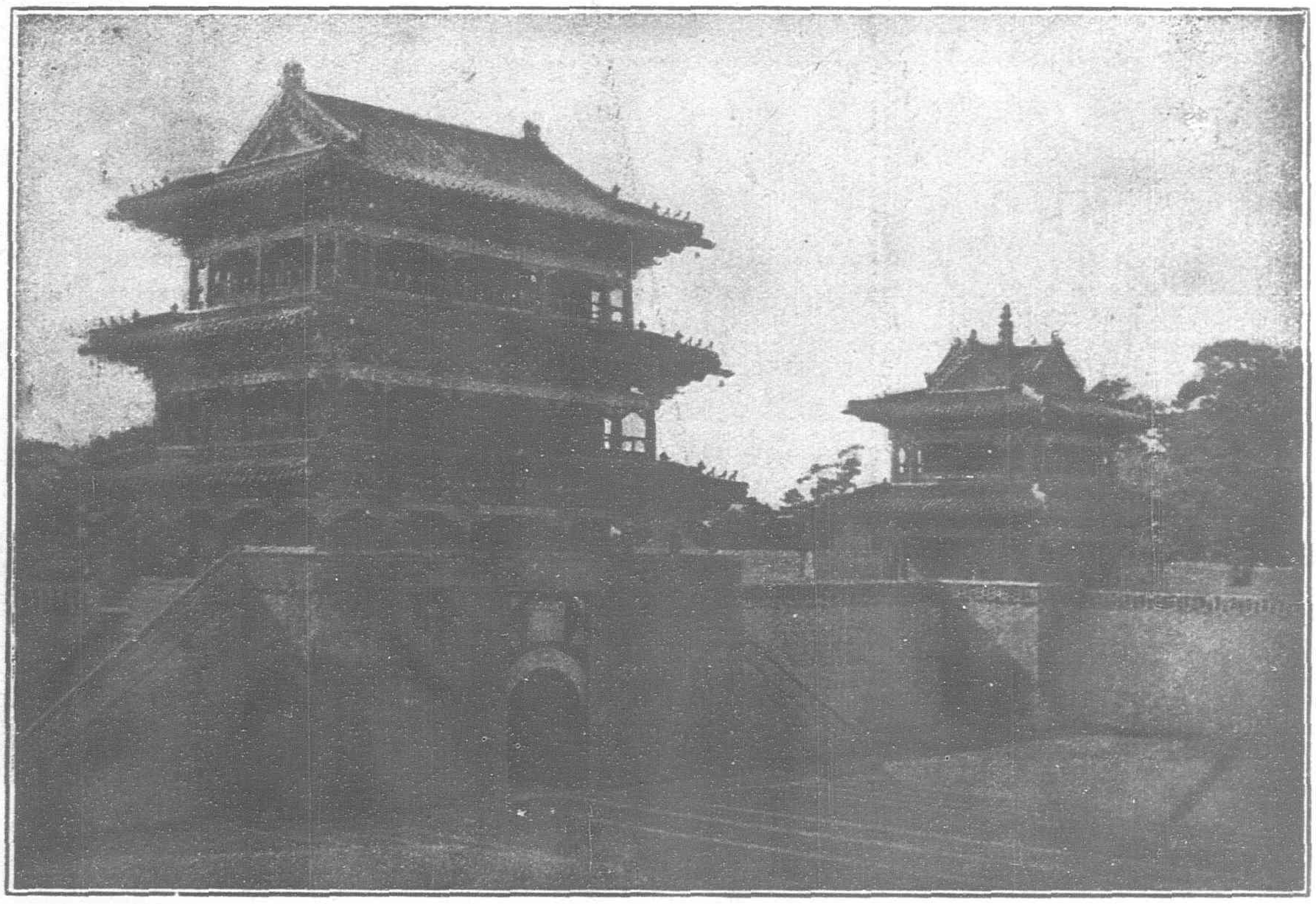
AT MUKDEN:—Peping-Mukden Line of the Chinese Government Railways (24 hours only by Express between MUKDEN and PEPING).

AT SSUPINGKAI:—Ssupingkai-Taonan Line of the Chinese Government Railways (10 hours only between SSUPINGKAI and TAONAN).

AT ANTUNG:—The Chosen Railway of the Japanese Government Railways (22 hours and a half only by Express between ANTUNG and FUSAN).

AT DAIREN:—The Osaka Shosen Kaisha's Dairen-Shimonoseki-Kobe-Osaka Mail Steamer Line (4 days only between DAIREN and OSAKA).

AT DAIREN:—The Dairen Kisen Kaisha's Dairen-Tsingtao-Shanghai Mail Steamer Line, etc. (3 days only per S.S. "Dairen Maru" between DAIREN and SHANGHAI).



North Mausoleum, Mukden.

Yamato Hotels at Dairen, Hoshigaura, Port Arthur, Mukden and Changchun

SOUTH MANCHURIA RAILWAY COMPANY

Head Office: DAIREN

Branch Offices: TOKYO, OSAKA, SHIMONOSEKI, SHANGHAI, HARBIN, KIRIN, PEPING AND NEW YORK

Cable Address: "MANTETSU" or "SMRCO" Codes: A.B.C. 5th & 6th Ed., Lieber's and Bentley's

Capital (Fully Paid-up):
Yen 100,000,000

Reserve Fund:
Yen 116,200,000

CORRESPONDENTS
AT ALL
THE CHIEF
COMMERCIAL CITIES
IN THE WORLD

The Yokohama Specie Bank, Ltd.

Established 1880

DIRECTORS:

President: KENJI KODAMA
Vice-President: KIMPEI TAKEUCHI
MASUNOSUKE ODAGIRI
BARON KOYATA IWASAKI
FUKUSABURO WATANABE
BARON ICHIZAEMON MORIMURA
REITARO ICHINOMIYA
KUNIZO MOGAMI
TOSHIKATA OKUBO
YAKICHI SUITSU
EIKICHI TSUYAMA

Head Office: YOKOHAMA
Manager: Y. NOGUCHI

TOKYO BRANCH
No. 2, Honryogaecho, Nihonbashi-ku.
Manager: H. KASHIWAGI

SHANGHAI BRANCH
No. 24 The Bund
Manager: N. WATANABE

Marunouchi Agency
No. 2. 1-Chome, Marunouchi, Kojimachi-ku.
Agent: H. Kashiwagi

BRANCHES AND AGENCIES:

Alexandria (Egypt)
Batavia
Berlin
Bombay
Calcutta
Canton
Changchun
Dairen (Dalny)
Hamburg
Hankow
Harbin
Hongkong
Honolulu
Kaiyuan
Karachi
Kobe
London
Los Angeles
Manila
Mukden
Nagasaki
Nagoya
Newchwang
New York
Osaka
Paris
Peiping
Rangoon
Rio de Janeiro
Samarang
San Francisco
Seattle
Shanghai
Shimonoseki
Singapore
Sourabaya
Sydney
Tientsin
Tokyo
Tokyo (Marunouchi agency)
Tsingtao
Yokohama

CORRESPONDENTS AT ALL THE CHIEF COMMERCIAL CITIES OF THE WORLD

Interest allowed on Current Accounts and Fixed Deposits on terms to be ascertained on application.
Every description of Banking business transacted.
For particulars, apply to the Managers.

MACHINERY AND SUPPLIES FOR EVERY BRANCH OF ENGINEERING

INGERSOLL-RAND

PORTABLE AND STATIONARY AIR COMPRESSORS AND PNEUMATIC TOOLS

SCHINDLER ELECTRIC LIFTS

FOR PASSENGERS AND CARGO

SIEBE, GORMAN'S

DIVING GEAR AND BREATHING APPARATUS

TRANSMISSION GEAR OF EVERY DESCRIPTION,
PULLEYS, SHAFTING, HANGERS, BELTING

The Jardine Engineering Corporation, Ltd.

(Incorporated under the Companies Ordinances of Hongkong.)

8a YUEN-MING-YUEN ROAD **SHANGHAI**

Branches : **HONGKONG, TIENTSIN, NANKING, HARBIN, MUKDEN AND TSINGTAU**

Printed by the NORTH-CHINA DAILY NEWS AND HERALD, LTD., for the Proprietor.

The Far Eastern Review

ENGINEERING FINANCE COMMERCE

VOL. XXVIII SHANGHAI, JANUARY, 1932 No. 1

Again, Stay Out of It!

Treaties Cannot Control the Forces at Work in Asia

By GEORGE BRONSON REA

Within the past ninety years the population of the world has doubled. One eminent sociologist expresses the belief that in another century the present 1,900,000,000 inhabitants of the earth may have increased to be more than sixty billions in the year 2030. American and northern European critics who see the birth rate in their own countries more and more approximating the death rate, scoff at these figures. But if the nations of the West should follow the Asiatic conception of family life, these figures would not be very far wrong. If the peoples of the West persist in applying artificial checks to their increase to a point where the population remains more or less stationary while the Asiatic continues to indulge his mania for procreation we will witness in the next century a doubling of their numbers every two decades. At this rate of increase by 2030 there will be nearly twenty billion Chinese, Koreans and Japanese, who long before that time would have asserted on the battlefield their right to exist.

Fantastic ? Not at all. In Java, under the "benevolent" rule of the Dutch the Asiatic has in a hundred years increased from five millions to thirty-seven millions, doubling their numbers every thirty-three years. With a little more hygiene, sanitation, inoculation against disease and other advantages of humane administration, they will multiply still faster. At this rate there will be 280,000,000 Malays in another century. There is no problem about their outlet. Sumatra, Borneo, New Guinea and other isles of the Dutch East Indies are ready to receive them when living conditions in Java become intolerable. Their future is assured.

1895 - 1932

History Repeats Itself

"In the war with Japan, China was not merely defeated—she was humbled. Her armies never once scored a victory, but fled from every field of battle, and surrendered one strong position after another. Her fleet on which many hopes had been based, was driven ignominiously to the shelter of fortified ports. Her commanders showed themselves all incompetent, and many, cowards. Her administration was as inefficient and corrupt in the hour of the nation's peril as it notoriously was in time of peace ; and her people, while they had acquired some sense of nationality, were still an inchoate mass, in which self-interest was the only motive power and blind fury replaced patriotic endeavor. During the war her most energetic efforts were directed, not to defeating the enemy, but to invoking the intervention of foreign powers, which, her rulers hoped, might save her from the results of their own weakness, without the necessity of making any serious efforts to remedy the causes of that weakness. IT WAS THE DUTY OF FOREIGN POWERS, AND NOT ANY PART OF THE DUTY OF CHINA TO SAVE CHINA FROM AGGRESSION AND DISMEMBERMENT."

The above is the summing up of two eminent historians of the Sino-Japanese War of 1895. It will be found on page 410 "Far Eastern International Relations" written by Hosea Ballou Morse, one of the foremost authorities on Chinese history and Professor Harley Farnsworth Mac Nair, of the University of Chicago. The China edition of the book that was to have been published in Shanghai was prohibited by the Nanking Government, enjoying the unique distinction of being the first work by a foreigner ever to have come under the official ban in China.

The pressure of one generation upon the other, living under a family system that Professor Ross likens unto a rabbit-warren ; the uncontrolled operation of the Asiatic conception of morals under a benevolent and humane administration that has provided the ideal surroundings and encouragement for indulging to the full the procreative mania of the East, is seen in Korea where the population has doubled its numbers under Japanese rule in twenty-three years. At this rate of increase the present 20,000,000 Koreans will number 200,000,000 in another century.

We leave India out of the picture. As a dominion of the British Empire, India will seek a solution to her population problem within the Empire. Southern Asia will slop over into Africa or, if shut out of Africa, they will press upon the northern and eastern frontiers and find an outlet in Asia, complicating the struggle between the Slav and the Mongol for the possession of the waste spaces. This, however, is Britain's problem and not ours.

Let us turn to Soviet Russia. A recent report of the Demographic Institute of Moscow estimates that the people of Russia are doubling their numbers in forty years. The present population being 170,000,000 this means more than a billion in 2030.

With a population that has never been properly counted, but which is estimated at anywhere from four to five hundred millions, China is an enigma, the despair of the statisticians. There are no statistics, no census, nothing but pure guess-work. But we know that overproduction of humanity is chronic in this country, that the ills that have befallen the nation arise from a procreative recklessness based upon ancestor worship which no man-made laws can change. We know that the checks now being applied by missionaries, hospitals, sanitation, railways, flood prevention and the other helps that lower the death rate are merely serving to overturn the old balances. If we apply the Korean rate of increase to China, in a hundred years, estimating the present population at 500,000,000, there will be more than eight billion Chinese. Say they double their numbers in forty years ; in another century there will be three billion. Where are they to go ?

Americans believe that they have fully safeguarded their civilization against this menace. Is that true ? Look around our big cities and seek the answer. Ask the police and immigration authorities for the facts. Look at Mexico, at Cuba, the West Indies, Peru and other Latin American countries. Look at the isles of the Pacific, the Philippines, and the Malayan countries. They are all preferred economic dependencies of China pouring more wealth into the country than foreigners have ever taken out of it. We may put up the bars, but the Chinese find their way in just the same. The Chinese emigrate undeterred by exclusion acts. Somehow, some way, they wiggle through the barriers, and wherever they go they prosper and amass great wealth.

According to Mr. Julean Arnold, the American Commercial Attaché in China, the 70,000 Chinese in the United States remit each year to China the respectable sum of $25,000,000. Mr. Arnold, however, does not hazard a guess as to how much Americans in China remit to the United States. Many American firms would be glad if they could collect what is owing to them by the Chinese Government. Americans are very much concerned about the Open Door in China ; in fact, they would even go to war to uphold this doctrine, but it will take many years of preferred and profitable trading on the part of Americans in China to approximate the profits the Chinese extract from the United States. Americans may believe that China is one of the greatest future outlets for their manufactured products. Maybe it is. Maybe it is worth fighting for. But in the meantime our country remains the preferred economic dependency of China, the richest of all lands for their colonization.

The population of the United States is expected to reach 146,000,000 in 1950. Let us estimate that it will double in another fifty years and we have 292,000,000 at the end of the century. Apply the same rate of increase to the Western European nations and the total still is only a drop in the ocean of humanity holding opposing ideas about family and sex relations. The racial problem is one of simple mathematics. All we have to assume is that the Slavs, Mongolians and Hindus will double their numbers within forty years and we have the appalling total of 6,660,000,000 in 2030. Leave the Hindu and Malay out of the picture and confine our forecast to the Slav, the Chinese and Japanese with their present total of 760,000,000. In another century there will be 4,560,000,000. It is folly to say that these figures are fantastic ; that nature will apply her own checks to keep down the increase. They may have been true a century ago, but not to-day. Science, medicine, engineering and intelligent governmental supervision are more and more coming to the aid of man in his fight against nature. The old checks and balances are being disturbed.

The development of China, Siberia, Mongolia and Sinkiang ; their opening up to colonization by railways and air routes ; the reclaiming of these waste spaces to cultivation ; the application of law, order and the other concomitants of good government, will take care of this increase. Manchuria and Siberia are vast granaries ; the Altais and Himalayas contain the last great mineral reserves ; their forests, their fisheries, their grazing lands are inexhaustible. Everything is there to facilitate the rapid multiplication of the races. All that is lacking is good government.

While our savants and philosophers argue, discuss, advance reasons and write books and treatises to prove that these figures are all wrong, the phenomena is taking place before our very eyes. We have held no illusions about these matters. For more than twenty years we have at various times invited attention to the realities which underlie the Pacific problem. In our library are a score or more weighty, authoritative tomes filled with statistics ; in our files a mass of newspaper and other clippings, all, with few exceptions, lulling the reader to sleep by presenting scientific data and arguments proving that the Japanese are in no need of relief from pressure of population ; that China is not overcrowded ; that the Slav does not multiply and does not need to expand. We are creating a bogey.

Yet the figures keep mounting. The forecast we made twenty years ago, fifteen and ten years ago, has proved to be correct. We see what is happening in Java and in Korea ; we see Japan now increasing at the rate of a million a year. Ten years ago the yearly increase was about 600,000. But we do not see what is going on in China simply because there is no responsible government and no statistics. It is no exaggeration to say, however, that the Chinese are increasing as rapidly as the Slav or the Japanese, or, in places, as rapidly as the Koreans.

Long before the century has passed these masses of Asiatics, compressed within their habitat by the exclusion acts of other nations, must fight for their right to survive. Nothing can stop this conflict. It is inevitable. It is a mistake to believe that treaties designed largely to regulate the affairs and relations of western nations can ever apply to conditions in Asia. It is a mistake even to try to apply legal instruments to control forces that can be repressed only by self-interest and enlightenment. We certainly can never halt the reproduction of five hundred million people who cannot be reached by any campaign of education.

All the treaties in the world, all the laws devised since the beginning of the world, will not put a stop to the natural increase of a people whose whole conception of life, morals and sex relations are diametrically opposed to those ideals which guide the framers of world peace pacts. The only result of enforcing adherence to these instruments against any particular Asiatic nation is to interfere in the struggle for existence, in favor of another equally prolific people. In the present blow-up in Manchuria, if we insist upon the rigid application of our interpretation of the treaties, we are simply placing ourselves squarely across the path of Japan's destiny and handing over the future of Asia to the more prolific Chinese, who in due time will become easy prey to another people who will laugh at any attempt to check their expansion.

As an American, solely interested in the future welfare of his own country, we hold firmly to the belief that this is not our fight. We have enacted laws which close our own doors to this Asiatic flood. We have safeguarded ourselves and our children from attack by Japan by limiting her naval armaments. As long as Japan accepts an inferior ratio in battleships and cruisers we have nothing to fear from her army. We have, unconsciously perhaps, diverted the solution of the racial problem from the Pacific into the center of Asia where it belongs. Our policy should be to leave it there, keep it there and let the Koreans, the Japanese, the Chinese and the Slav settle it between themselves.

If we follow up Japan in Manchuria and again break down her defenses against the Slav and force her to withdraw, we sign her death warrant as a great power and draw upon ourselves the solution of a problem that does not immediately concern us. The Chinese will not fight. Why should they ? For the last quarter of a century we have been devising and signing treaties, pacts, conventions and what-not that fully protect and safeguard their existence. Again, unconsciously, we have played China's game, becoming her protector against all outside foes. The whole effect of the League of Nations, the Nine-Power Treaty and the Pact of Paris has been to protect a nation that will not fight for itself, insuring to its people their right to indulge to the limit a procreative mania that will within the next two decades bring the issue of the races to a crisis.

Japan technically may be wrong in Manchuria. Let it go at that. She also morally may be wrong. Let that go. But she has declared that she will respect the territorial integrity and administrative independence of China. Japan will live up to her treaties. She has her own vital problems to work out and the people of Japan are behind their government to a man. They have a case that goes beyond the treaties and unless the United States is willing to fight Japan, we should go slowly, keep our temper, refrain from writing unnecessary notes, hurling editorial insults and invective and let her work out her own salvation. Japan knows how to deal with China. We don't. If pressure from the outside must be exerted to bring about a pacific solution, it should be along lines that will influence China to meet Japan alone and by mutual concession find a basis for direct negotiation. Japan is not at war with China. Diplomatic relations have not been severed. The two nations should be coerced to find their own solution to the problem. Any other policy on the part of the American Government is madness.

(Continued on page 7)

Basic Problems

Japan's Right to Exist

By GEORGE BRONSON REA

SECRETARY Stimson's notes to China and Japan place America's treaty rights in Manchuria superior to every other consideration, laying down the principle that as far as Japan is concerned she will not be permitted to seek any territorial aggrandisement at the expense of China or derive any special benefits from her appeal to the law of self-defense. So far, however, Japan has not claimed any such advantages or declared an intention to do so. The preservation of America's treaty rights would seem to be the paramount issue in the Manchurian dispute, more important than the validity of other equally important treaties, Japan's economic or strategic position, the law of self-defense, or any rights that Japan may have acquired in that region as the result of two wars and enormous sacrifices in blood and treasure.

The firm declaration on the part of Washington, if carried to its ultimate enforcement, will sooner or later draw the United States into a war in the Pacific on the side of China and Russia, all peace pacts to the contrary notwithstanding. *The Far Eastern Review* has been accused of being a "Japanese propaganda organ subsidized by the Japanese Foreign Office" because for many years it has vigorously opposed any interference on the part of the United States in a dispute which does not concern us. We disagree with our Chinese friends only in one main point of policy. With a deep understanding and sympathy with their problems, we also sympathize with Japan's fundamental problems, believing she has won in fair fight her right to enjoy the fruits of her two victories in Manchuria. For this reason, we have refused to lend ourselves to the dissemination of any propaganda calculated to incite ill-will between the United States and Japan. We made ourselves clear on this point twelve years ago when we said that we saw no good reason why the youth of America should fight Japan for the sake of four hundred million sturdy pacifists who would not fight for themselves. We still hold to this doctrine as the guiding feature of our editorial policy.

At that time, Chinese propaganda directed from Peking, almost precipitated a war between the United States and Japan. We broke with our Chinese friends over these issues and in order to clarify them so the American people would understand what it was all about, it became necessary to present the Japanese side of the case and establish certain basic historical facts. This we have done, not because we are pro-Japanese, or anti-Chinese, but because simply we are one of those hard-headed realists, thinking for ourselves and basing conclusions on the facts with the courage of our convictions.

The Far Eastern Review inclines to the belief that after the American Government successfully has barred the Japanese from entering its own territory, to follow them up and interfere with their activities in Manchuria is just another way of provoking hostilities. A study of these problems convinces us that the League, the World Court, the Nine Power Treaty or the Kellogg Pact cannot control the irresistible forces at work in the Far East. A rapidly mounting population, doubling its numbers in places seven times as rapidly as the white man, cannot be artificially confined in a restricted area. The resulting pressure will follow the natural law unless an escape is provided. No virile people meekly will commit race suicide when there exists near at hand vast undefended empty spaces inviting their occupancy. The pressure will seek its outlet at the point of weakest resistance.

If the American Government is to squat on the safety valve of this super-power generator, it should stop talking about disarmament and lose no time in donning a suit of twenty-inch armor plate that will save the nation from being blown to perdition when the inevitable happens. With all our deep sympathy and friendship for China, we object to the United States playing the rôle of Jim Bludsoe's nigger in a triangular race whose dramatic finish is just as certain as the one in which John Hay's hero took such a spectacular part. This may be a selfish creed but the instinct behind it is the basis of all human and animal nature. The prolific Chinese would have America fight Japan while they sit on the side-lines watching both combatants go down to defeat and disaster. They would then garner the fruits of victory. There is nothing to be gained by either side in a war between the United States and Japan. If we win, we lose. The Chinese would be the only gainers. If there is to be any fighting over Manchuria we believe it should be done by those directly interested in the outcome. Diplomacy, arbitration, mediation, conciliation, outside intervention or invocation of treaties may for the moment control the pressure but the guage is there for all to read and heed. The indicator, already past the danger mark, is steadily rising. Unless we devise some method of regulating the furnace, instead of merely squatting on the safety valve, the explosion which nearly wrecked the world in 1914 will be repeated, and it will blow the remnants of civilization to Kingdom Come.

It is time to speak plainly. We have no illusions about Japan. We understand her problems and have tried to present them in an impartial manner. We admire and respect the Japanese. We believe in them and have faith in them. They are facing the crisis of their national existence. The world is not dealing with a gentle, polite, yielding and pacific Oriental people meekly accepting whatever is handed out to them. We are dealing with a people, like ourselves, proud, chivalrous, determined and valorous; in every sense our equals. These people are extremely reticent. Conscious in their own hearts of the justice of their cause, they do not talk about what they will do. They do not boast or rattle the sabre, but they are grimly determined to fight for their right to exist. The white nations have backed them into a corner and have told them in so many words that the fair places of the world are not for them or for their children. They, of all nations, are asked to practice birth control and commit race suicide while their next door neighbors are permitted free rein to indulge their procreative mania and swarm into the few vacant spaces left in Asia. And the Chinese, relying upon the League, the Nine Power Treaty and the Kellogg Pact to protect them, have told the Japanese in equally unmistakable words that they are unwanted in China; that they must get out of Manchuria, bag and baggage. Backing their ultimatum with an army of three million men, the Chinese threw the gauntlet in Japan's face. There is no other interpretation for Dr. C. T. Wang's stand on the negotiation of a new commercial treaty with Japan. Now, Japan may recognize the right of other nations to close their doors to her people, but she will never submit to such humiliation from China—at least, not where Manchuria is concerned.

To save themselves from an Asiatic inundation, the white nations of the Pacific rim have built up barriers against their entrance. The League has had no time to study the racial problem or to devise regulations to control the repressed forces which in Europe found their outlet so explosively in 1914. The League has given no heed to Italy's problem or to the forces which are once more gathering momentum in Germany. None of the victors in the World War will surrender one square mile of their mandates to relieve the pressure in Europe. Italy is arming, preparing and telling the world in unmistakable words that she will fight. Germany is again approaching the danger mark, clamoring for return of her lost colonies and telling the world she will no longer pay up. At times, there seems to be a prospect that these demands of Italy and Germany will be satisfied, but in all the talk and discussions no mention is made of Japan's desperate plight. Japan, a member of the League with accounts paid to date and in order, sits in its councils, alert and attentive to everything which remotely affects her interests. She listens to plans and proposals to relieve Italy and Germany, but knows in her heart that any request on her part for similar favors will be met with either an emphatic negative or with stony silence.

Japan's claim for the recognition of racial equality in the Covenant of the League was unfairly rejected at the outset and there is little hope that this imputation of inferiority will ever be removed. Japan has bowed to the verdict of the Nations and has done her best to abide by their judgment. She has faithfully played the game, keeping her people at home, and absorbing their increase in industries. Her one asset is the labor of her people. By superior business organization and buying and selling methods, she has opened overseas markets for her manufactured products, eking out a precarious existence by importing raw or partly finished materials and exporting the finished goods. Take away these markets for the products of the toil of her people; deny to them the right to emigrate, and they starve. Invariably, when Japan develops a market for her manufactured goods, even in countries where she purchases the bulk of her raw materials, discriminatory tariffs are applied to kill her trade. Add to this the incessant boycotts and campaigns to ruin her investments in China and it is easy to understand why the Japanese people feel that not only are they being forced into a corner by the application of rigid immigration laws in other countries, but also they are being deprived of the means of sustaining themselves. Take it from either angle and the result is the same. Japan is being slowly strangled and when China, protected by the League and the Kellogg Pact, kept pulling the noose tighter and tighter, and the rest of the world made no move to intervene, Japan did exactly what any other nation of red-blooded men would have done under similar circumstances.

China's refusal to recognize a treaty, which concedes to the subjects of Japan the right to own and lease land in Manchuria and Mongolia, closes to them their sole remaining outlet in the ringed fence erected by other nations for their own protection against the Japanese overflow. It is not that Japan is in such dire need of an immediate outlet for her own people. Her Korean subjects, adhering to the Confucian conception of ancestor worship, are multiplying like rabbits. Chinese publicists make the point that the Koreans are being driven out of their homeland to make room for the Japanese; that this inhuman policy is driving the Koreans across the border into Manchuria and depriving the Chinese of their lands. Yet the latest annual report of the Government-General of Chosen (1928-29) shows that in 1906 the native population of Korea was 9,781,000 and in 1929 it was 19,311,000, a doubling of numbers within twenty-three years or, seven times as rapidly as Western European nations. This does not include the million or more Koreans who have emigrated into Manchuria and the maritime provinces of Siberia.

These figures reveal what the rest of the world must expect from peoples whose conception of morals is, diametrically opposed to those upon which Western civilization is founded. Here we can see what the Chinese family system and cult of ancestor worship, combined with polygamy, concubinage and other facilities for reproduction, means in terms of population increase. Add to this situation, good government, sanitation, hygiene, hospitals, schools, improvement of agriculture, absence of floods, famines, plagues, epidemics, earthquakes, banditry and war with resultant prosperity and the picture compels serious attention. Apply this same rate of increase to China where the basic cultural and moral conditions are identical and where all that is lacking is good government and the employment of the same checks upon famines, floods, disease, banditry and war, and we begin to realize something of the tremendous forces being generated in this mighty caldron of humanity.

In these figures we see the operation of the stern economic law which compels the poor Korean to seek a livelihood in Manchuria, where he comes into conflict with the Chinese by underbidding him in the competition for existence. Human nature is very much the same the world over. In the United States the unrestricted entrance of a racial group with whom our farmers and laborers could not compete engendered violent antipathies, disturbances, mob excesses and grave international complications, resulting in the enactment of state laws prohibiting the ownership of land by aliens non-eligible to citizenship and finally by federal laws enforcing their rigid exclusion.

Forced out of his country by the pressure from within, the Korean had only one place to go and there, because of his lower economic status, he is able to compete successfully with the Chinese, who to protect themselves have resorted to the same measures found necessary in California. There is only one difference. Under the 1915 Treaty Japan acquired the right for her subjects to own and lease land in Manchuria. The Chinese, however, contest the legality of the Treaty and have refused to permit the clause to be carried into effect. Standing firmly on their declared policy to ignore this treaty the Chinese authorities have enacted laws which make it a treasonable offense for a Chinese to sell or lease land to the Japanese and have stubbornly opposed the settlement of Manchurian lands by the Koreans, subjecting them to every class of persecution and indignity. The Japanese Government, the legal protector of its Korean subjects, has protested time and again and has sought by every means within its power to arrive at a satisfactory solution. This pacific policy failing to stop these persecutions, convinced the Koreans that they had no redress and their resentment flared up in the massacres of last July. Unless Japan abandoned her program of conciliation she faced revolution in Korea. The recent attempt to assassinate the Emperor is merely an indication of this deep-rooted unrest menacing the very existence of the state.

For the moment we can leave Japan's population problem out of the picture and confine ourselves to Korea. If China can enforce her viewpoint the Koreans must remain at home and practice birth control in order that the vast spaces in Manchuria and Mongolia shall be reserved for the equally prolific Chinese. Such a solution hermetically confines Japan in her own watertight compartment and the overflow of her Korean subjects must find its outlet in Japan proper with the same inevitable clash between a higher and lower economic element that bodes ill for the Koreans who underbid the Japanese in the struggle for existence.

This is the problem as we see it. In any attempt to find a remedy we again come squarely up against the validity of the 1915 Treaty. With all due respect and sympathy for the Chinese side of the case it is difficult for us to see why the United States should interfere in this dispute. Underneath the treaties, covenants and peace pacts seethe the forces which cannot be controlled by legal instruments. If China is upheld and the League, the Powers or the United States intervene, the explosion that will follow will wreck the world and hand the future of civilization over to the Chinese and the Slav. Viewed from this angle the recent events in Manchuria are merely the preliminary warnings of what we must expect unless immediate attention is given to those deeper causes of world unrest which find expression in the bellicose mutterings of Italy, the repressed indignation in Germany and the more silent yet grim determination of Japan to survive.

There is one possible and practical political solution for the problems of Italy and Germany. In the interests of European peace France might be induced to surrender some part of her vast African empire to satisfy the aspirations of Italy while Great Britain might forego her mandates over the old German African colonies in order to placate Germany. But what can the League or the Powers do for Japan? They might transfer to her the mandate over New Guinea, but this would be violently opposed by Australia, New Zealand and the whole British Empire, with the United States in full accord. The outlook for world peace is far from bright when viewed from this angle. None of the victors in the late war will surrender an inch of their territorial gains in order to preserve the future peace of the world. They expect the United States, however, to cancel their war debts and pay for a war from which we derived no material benefits. It is well to keep this point in mind in discussing the problems of peace. For the moment the pressure has broken through in the Far East. To-morrow the eruption will take place in Europe. America squats on Japan's safety valve while Britain and France are doing the same to Italy and Germany.

The Asiatic exclusion laws prevailing in the White Man's domains bordering the Pacific will remain in force. There are no unoccupied waste lands in other parts of the world available for Japan's overflow. So we come back to Manchuria and Mongolia where Japan has fought two wars and acquired an outlet, but is prevented from utilizing it because China refuses to recognize the validity of the treaty which opens up for her this sole remaining avenue of escape. In view of these facts is the League of Nations and the United States to follow Japan into Manchuria and Mongolia and invoke treaties and their rights under these treaties when they made no move to defend these rights when Japan ousted Russia from Manchuria or when Russia annexed Mongolia and told them in plain language what they could do about it? Did the Powers or the League even mildly remonstrate while an aggressive Nationalist China was breaking down the whole series of treaties safeguarding foreign rights in this country?

In their apparent eagerness to surrender their own rights did any of the other powers stop to consider Japan's problem ? No, it was everyone for himself and devil take the hindmost in the scramble for Chinese friendship and business. China skilfully played off one against the other. China had clearly announced that no new treaty of commerce or amity could be discussed with Japan until she surrendered the Liaotung Lease and withdrew her troops from Manchuria. In other words, China proclaimed that she could have no friendly relations with Japan until her viewpoint on the 1915 Treaty was recognized and she proceeded to enforce her demands by boycotts and violent anti-Japanese agitations. China went to war with Japan within the Kellogg Pact, a war just as harmful and destructive as though it were fought with battleships, bayonets and bullets. Viewed in its relation to the fundamental problem outlined in this article, this decision on the part of China signed Japan's death warrant, closing to her the sole remaining outlet for the overflow of her own people and her Korean subjects. China refused even to discuss the question and provoked a clash that would throw her whole case into an international court.

We have refrained from presenting or enlarging upon that side of the triangular race which brings in Soviet Russia. It is sufficient, however, to reproduce a Trans-Ocean news dispatch dated Moscow, December 6, which states :

> "Soviet Russia's population will increase to 250,000,000 during the next two decades, according to the estimate of the Demographic Institute published to-day. The present population is estimated at 170,000,000."

This tells us that the people of Russia are doubling their numbers in forty years. The Russian people will overflow into Siberia and Central Asia. They have already erected a fence around Mongolia and closed the gates. Sinkiang is theirs to take when they want it. Behind Russia stands Germany also looking eastward towards Siberia as a future outlet for her people, unwanted in other countries. Japan is doubling her numbers in 43 years ; her Korean subjects in 23 years. In another decade 20,000,000 more Japanese will demand the right to live. Soviet Russia, backed by Germany, must find room for another 40,000,000 in the same period. In the absence of reliable statistics it is difficult to estimate the increase in China, but it is conservative to say that the Chinese with their procreative recklessness are multiplying as rapidly as the Japanese, and in some places as rapidly as the Koreans. The latest official estimate of the population of China places it at over 500,000,000. In the next decade there will be another 100,000,000 more Chinese. Barred from other countries where will these 160,000,000 Slavs and Mongolians find an outlet ? There is only one answer ; in Manchuria, Mongolia, Siberia and Central Asia. The war of the races for the right to exist will be waged between Mongols and Slavs on the plains of Central Asia where it belongs and all the peace pacts in the world will not avert it.

When Japan appeals to the law of self preservation to justify her recent actions in Manchuria there is more in that statement than appears on the surface. All the outside world can see is the conflict between a small, well-organized Japanese force and an overwhelmingly superior but undisciplined army that refuses to fight and seeks protection behind the League and the anti-war pacts. The Foreign Offices of the Powers, lost in a maze of treaties of their own contrivance, are unable to see beyond their legal phraseology and discern the fundamental causes which vitiate their meaning. After closing their own doors to the entrance of Japan's surplus and driving them into a corner from which there is no escape except through Manchuria, the Powers suddenly manifest an interest in their rights in this territory and insist that Japan respect the treaties she has entered into with them.

We believe in the sanctity of treaties and other solemn contracts, but we also believe in fair play and justice. There comes a time in the life of nations when treaties and all other sacred obligations become subordinated to the law of self preservation. Despite the fact that the Kellogg Pact is based squarely on the right of each state to apply the law of self-defense at its own discretion and that the Nine Power Treaty has been violated by every signatory that has entered into relations with Russia and ignored in all its main essentials by its beneficiary, it is possible that a case may be made out against Japan. It may be that Japan's treaties with the United States have become the supreme law, more important to the world than Japan's exercise of the right of self-preservation. But let us be honest with ourselves and before we condemn and hold her responsible, before we get ourselves involved in this dispute to the point where we cannot get out without humiliation or war, let us try to look at her side of the case and ask ourselves what we would do under similar circumstances.

We can delude ourselves into a belief that we are right and Japan is wrong. We can repeat the great mistake of 1914 when the whole world united to crush a people whose real transgression was their failure to control their powers of reproduction and in presuming to believe that they would be permitted to acquire colonies and enjoy their "place in the sun." We can do the same thing with Japan. We can marshal world opinion against her. We can boycott her diplomatically and economically and if that fails to bring her around to our viewpoint, we can once more ally ourselves with Europe and fight another World war over the sanctity of treaties. We can smash her as we did Germany and when it is all over and civilization is broken and bankrupt, the real issue will remain just where it was at the close of the former senseless struggle. Instead, however, of preserving the balance of power we will go down to ruin while Asia will be handed over to the prolific Chinese and its commercial exploitation to the exulting Slav. The two nations which have consistently denounced their treaties and obligations, repudiated their debts and made possible the conflict will divide the fruits of victory between them.

Because we see the problem from this angle we have done our best to keep America out of this Manchurian mess. Otherwise, knowing how our people react to appeals from China, we would be swept on a wave of emotion and sentiment into another catastrophe for a nation that has shown no mercy or concern for the untold millions of its own defenseless people ruthlessly slaughtered by bloodthirsty armies which yell for help when they face a dose of their own medicine.

For years the trend of America's Far Eastern policy has been to interfere in questions which vitally affect the welfare, happiness and future of one of the proudest fighting races in the world. Unless we are prepared to fight Japan there must be an end to such meddling with affairs which only remotely concern us. The peace of the world is one thing, but there can be no peace without justice. When a nation of real men becomes convinced, rightly or wrongly, that it is being singled out for discrimination ; that it has no outlook, no hope for the future, no escape from the sentence imposed by a series of treaties which seem to deprive them of the right to defend themselves, then in their opinion these treaties are contrary to all principles upon which human justice is founded. Is it fair to invoke treaties against Japan for defending herself against a nation which has deliberately flouted these same treaties while the other signatories have made no protest and remained indifferent to events which finally compelled Japan to make a supreme effort to save herself from extinction ?

China is not altogether to blame for what has happened. The policies of the Powers and the League in compressing the explosive forces at work in Japan has resulted in these forces finding their outlet at the point of least resistance. Had the rulers of China been loyal to their people they could have averted the calamity by negotiating a solution of the difficulty with Japan or by placing the country in a state of defense.

For many years *The Far Eastern Review* has advised the Chinese to soft-pedal the Manchurian issues and co-operate with Japan for the development of the territory. Then when China grew prosperous and united under a strong central government the Manchurian problems would solve themselves automatically. Japan would be first to seek an amicable settlement of the disputes under some program that would satisfy every legitimate demand of China's national honor and dignity.

Our Chinese friends would not listen. Their political advisors and publicity agents have been the same group of professional anti-Japanese propagandists who ten years ago directed the campaign to bring about war between Japan and the United States and who have since opposed any rapprochement with Japan.

Much of the so-called "violent pro-Japanese propaganda" appearing in this magazine has been written for the express purpose of counteracting the pernicious activities of this group which, when it had the power and influence, attempted to impose its viewpoint on other newspapers by boycotts and other highly

(Continued on page 15)

Our Friendship for China

By *GEORGE BRONSON REA*

> **"The powerful monthly, 'The Far Eastern Review,' edited by G. Bronson Rea, an American, and former Military Attache in the American diplomatic service, is a violent pro-Japanese organ." ....Extract from an article entitled, "Japanese Propaganda in China" contributed by an anonymous writer to "The People's Tribune," December 26, 1931.**

THERE is only one road to popularity in China; that is to be at all times anti-Japanese. A foreign journalist may support the Chinese in ninety-nine per cent of their problems, but if he disagrees with them over Japan he is an enemy. The Japanese are always wrong; the Chinese always right. There is no middle ground. For the past twelve years the statement from *The People's Tribune* which heads this article has appeared in some form or other at regular intervals in the columns of a Shanghai publication whose anti-Japanese editor is noted for his amazing skill in turning flip-flops on the political flying trapeze and landing safely in the front seat of the incoming Celestial band-wagon. This patter and persiflage about *The Far Eastern Review* is the answer of a fanatical opposition unable to refute facts. We don't mind the yawps from the trained seals of Peking or Nanking, but we object when they appear in the official organ of a Chinese political party which purports to uphold and defend the doctrines of its departed Leader.

To the editor of *The People's Tribune* we retort that the Publisher of *The Far Eastern Review* is a better Chinese Nationalist and a more loyal friend of Sun Yat-sen than ninety per cent of his Janus-faced disciples who ignobly deserted him to accept lucrative positions under every military tyrant from Yuan to Chiang, betraying his trust, disgracing his cause, bringing hardship, misery and slavery to the people and humiliation and defeat to the nation.

We have no apologies to make to the Chinese people or to their self-imposed leaders. As to our editorial articles describing internal conditions in China, everything we have published in this connection is corroborated by the news reports of the past decade and can be duplicated in much more forceful language with extracts from the editorials and articles appearing in *The People's Tribune* or by quoting from the public protests of Kuomintang leaders or the interchange of official telegrams and correspondence which invariably precede civil hostilities. The real history of China is to be found, not in the censored or manufactured news of the daily press, but in these political documents phrased in the verbiage of Chinese etiquette which leave the reader in no doubt about their exact meaning. In effect, China's case is summed up in several fiery indictments launched by Chiang Kai-shek against the graft, corruption and ineptitude of the *tangpus* and in Madame Sun Yat-sen's frank and courageous denunciation of the betrayal of the Party her late husband founded and led to victory.

The Far Eastern Review has taken the lead in calling attention to a state of affairs that is a disgrace to civilization, a mockery of the homage paid to the man, who had he lived would have made it his first duty to protect and advance the rights, liberties and welfare of the people he loved and from whose loyalty and affection he derived the power that was handed down as a legacy to those who have betrayed his trust.

The Far Eastern Review has never wavered in its loyalty and friendship for the man who typified all that was best in the Chinese character. From the time in October, 1912, when he first became associated with Dr. Sun Yat-sen, to the day of his death, the Publisher of *The Far Eastern Review* defended him against all slander, calumny and unjust attack. We stood alone in defense of his character and the principles he championed at a time when public opinion was hostile to him and when practically every other foreign newspaper in China inveighed against him as a charlatan, a crook, a dangerous political agitator and worse. When the foreign press was applauding the double-dyed treason of General Chen Chiung-ming and when Doctor Sun was being hounded by his enemies, we prophecied that his influence would be greater after his death than in his life time.

We have seen Sun Yat-sen defamed, slandered and the ululating wolf pack after him in full cry to drag him down. When he was finally forced to flee for his life from Canton a campaign was launched to have him denied permission to land in Shanghai on the grounds that he was a dangerous political agitator, a menace to the peace, welfare and security of the Settlement. We saw him sick, despondent and disillusioned, practically driven from this isle of safety to his death. And we have seen his followers and disciples insult his memory by taking to their bosom one of his persecutors and exalt this individual into the position of chief publicity agent and spokesman for their government simply by reason of the man's violent anti-Japanese propensities.

We rarely refer to our association with Dr. Sun Yat-sen. In our humble opinion the highest mark of confidence ever conferred by any Chinese Government upon a foreigner is held by the Publisher of *The Far Eastern Review*. Dr. Sun Yat-sen's Power-of-Attorney to act for him as the Deputy Director-General of the Chinese National Railway Corporation to negotiate the loans for the construction of ten thousand miles of new railways, involving over a half billion gold dollars, and with no instructions to hamper his freedom of action, is a greater honor than all the decorations, medals and other marks of distinction conferred by any previous or subsequent Chinese Government on any foreigner. It constitutes a mark of trust, confidence and friendship that cannot be duplicated in modern Chinese history, a reward for work well done, for advice honestly and fearlessly given, for saving Sun Yat-sen's railway project from ridicule and himself from humiliation, and for preserving his reputation from being tarnished by those who would have used him as a second Ulysses S. Grant to fill their pockets with wealth, leaving him to be the scapegoat.

The Publisher of *The Far Eastern Review* has written no memoirs or abused confidences which are not his to reveal, but those of Doctor Sun's associates alive to-day and who have since held the highest posts in the gift of the Chinese Government, will understand what we mean. They will remember the afternoon in December, 1912, when from 2 o'clock until after 6 in the evening we fought, pleaded and finally shamed them in the presence of their Leader to accept the basic principles of honesty which transformed the Chinese National Railway Corporation from a grafting political machine for the personal enrichment of themselves into a clean, honorable commission deriving its powers and finances from the Government and answerable to that Government and the people of China for their activities. We saved Dr. Sun Yat-sen that day for China and when we left him to proceed to Europe and America on his mission, he placed his honor in our hands. We kept his record clean. To the day of his death we retained his confidence. The memory of his friendship and trust is our reward. We refer to it now only to remind his political followers that we have a right to invoke that friendship in matters wherein our own honor has been impugned.

For the benefit of the editor of *The People's Tribune* and the younger members of the Kuomintang we might add that on one of our last visits to Dr. Sun Yat-sen in 1924 he gave to us a message for his friends in Japan. It was published in part at that time in an issue of *The Far Eastern Review.* Doctor Sun was not an enemy of Japan. He looked forward to the day when the "younger brother" would return to the family and together face the world and work out the common destinies of their race. Had Dr. Sun Yat-sen lived, the problems that have since embittered relations between the two countries would long ago have been amicably compounded by mutual concessions. Had his alleged followers in the late régime adhered to his program instead of being led away by professional anti-Japanese agitators the new Government at Nanking would not now be called upon to face the most serious situation in the history of the country.

The *Far Eastern Review* may be "violently pro-Japanese;" that is merely a matter of opinion. But our thoughts are our own, based on our knowledge of facts and events. We are not afraid to face the facts and follow them to a logical conclusion. Sometimes the facts may be in dispute, and our conclusions may not at all times be right but they have the merit of not being inspired or prompted by others. Our "propaganda" is our own. We try to adhere to our conception of basic principles and if at times we cannot see eye to eye with Chinese of the official class, at least we remain true to our idea of what is best for the Chinese people. We have little respect for the Chinese militarists who have enslaved the people and answer their protests against misrule and oppression by a rifle volley or the swish of the executioner's sword.

Our sympathies go out to the inarticulate millions of China in their distress and agony and in advocating their cause we are being true to ourselves and to the memory of the man who honored us with his friendship. The cause of China is not the cause of the war-lords and their civilian puppets, but the cause of the people. As long as we remain faithful to principles and ideals that will in the end deliver the people from slavery and better their condition we are not worrying over what others think or say about us. We welcome fair comment, criticism or disagreement with our conclusions, but it ill becomes the official organ of the Kuokintang Party to permit itself to be made the vehicle for disseminating anonymous slanders initiated by those who villified and persecuted its departed Leader. If *The Far Eastern Review is "pro-Japanese," so was Dr. Sun Yat-sen.*

On the several occasions when Dr. Sun Yat-sen had to flee for his life to escape the headman's sword, where did he find safe haven and protection under the name of Nakayama? Where did he find friends who understood him and as far as they dared, comforted and supported him? Where was the main headquarters of the revolutionary group when it was conspiring for the overthrow of the Manchu Government? Where did Sun Yat-sen go on a visit of friendship the first opportunity he had after establishing the Republic? Do his followers forget the triumphal arches erected in Kobe to greet and honor the Hero of the Revolution on his arrival there in the Spring of 1913? Do they forget that on that momentous trip Doctor Sun organized a Sino-Japanese Industrial Company to undertake the industrial development of China, a company that still exists? Do they forget that the first funds that came to the new Republican Government in Nanking —(at a time when the financiers of all other nations had united to support Yuan Shih-kai)—came from the proceeds of the Y.25,000,000 loan to the Han-Yeh-Ping Corporation from the Yokohama Specie Bank? When Sun Yat-sen departed from Shanghai on his last earthly voyage, did this great Chinese Patriot travel on a Chinese vessel? No—he slipped out secretly on a small Japanese steamer bound for Kobe, transferring there to another Japanese steamer that would land him safely on the Japanese Bund at Tientsin. Dr. Sun Yat-sen, the Father of the Chinese Republic, the Leader of the Kuomintang Party, did not dare to entrust himself in the coastal waters of his own country on a vessel flying the flag of China, nor could he venture aboard a vessel of any other nationality that touched at Tsingtao, Weihaiwei or Chefoo on the way to Tientsin for fear of falling into the hands of his political enemies. Only under the flag of the Rising Sun was he sure of protection.

Dr. Sun Yat-sen was a friend of Japan and his friendship was reciprocated. He believed that the Japanese understood the Chinese better than Americans and Europeans and he welcomed their help in developing the country. Had the foreign policy of the National Government adhered to the broader lines of the legacy bequeathed to it by the Founder of the Republic, instead of being directed by those who sought popularity by inciting the masses against Japan, the two nations would long ago have composed their differences. For we repeat and emphasize with all the seriousness we can command that Dr. Sun Yat-sen was convinced from the evidence in his possession that the 1915 Treaty with Japan was signed, not under duress, but as the result of an ultimatum invited by Yuan Shih-kai.

Doctor Sun's statement was supported in 1923 by Viscount Kato, Japan's Minister of Foreign Affairs. It is supported by the statements of other responsible Japanese statesmen of high rank. It is supported by the testimony of Mr. T. Funatsu (now in Shanghai as the representative of the Japanese Cotton Mill-owners' Association) who was attached to the Japanese Legation in Peking in 1915 at the time the ultimatum was invited.

The evidence from unimpeachable sources so far corroborates this view of a controversy that has led China to disaster yet the followers of Dr. Sun Yat-sen, presumably with a full knowledge of the evidence in his possession, have made no move to clarify the dispute, permitting themselves to be guided by the testimony of the Peking Group of China's diplomats, who will never admit the truth of this statement.

The world is here confronted with a conflict of evidence, with neither side apparently willing openly to state their case. Japan says it is a closed incident. The treaty was signed and that is all there is to it. They place themselves in an equivocal position inviting world suspicion simply because they would shield China without thought of the consequences to themselves. No Chinese statesman of the old régime will admit the truth of a statement which places the stigma of double-dealing on Yuan Shih-kai.

This conflict of testimony, this refusal to face the facts or recognize a treaty signed under such conditions has been permitted to drag along until now it has resulted in the loss of Chang Hsueh-liang's hold over Manchuria. Unless a settlement is reached by direct negotiations it may well result in still graver consequences. Yet, rather than face these truths, or discuss them with Japan, China will pull down the whole world to ruin with her. In this matter, *The Far Eastern Review* is neither pro-Japanese nor pro-Chinese. We are just one hundred per cent American. Unless Washington watches carefully its step, the youth of America may again be called upon to sacrifice themselves in a war over a piece of paper whose validity is in dispute because no Chinese statesman dares to face his people and acknowledge or refute the testimony which places them in the wrong. The whole weight of Chinese diplomacy, the whole force of their propaganda is being brought to bear upon the American State Department to invoke treaties against Japan and precipitate a situation from which we cannot withdraw with dignity without recourse to hostilities. If America is to be drawn into this rotten Manchurian mess the American people will want to know the facts, all the facts and nothing but the facts. *The Far Eastern Review* states the facts as it knows them and challenges their refutation.

Again, Stay Out of It!

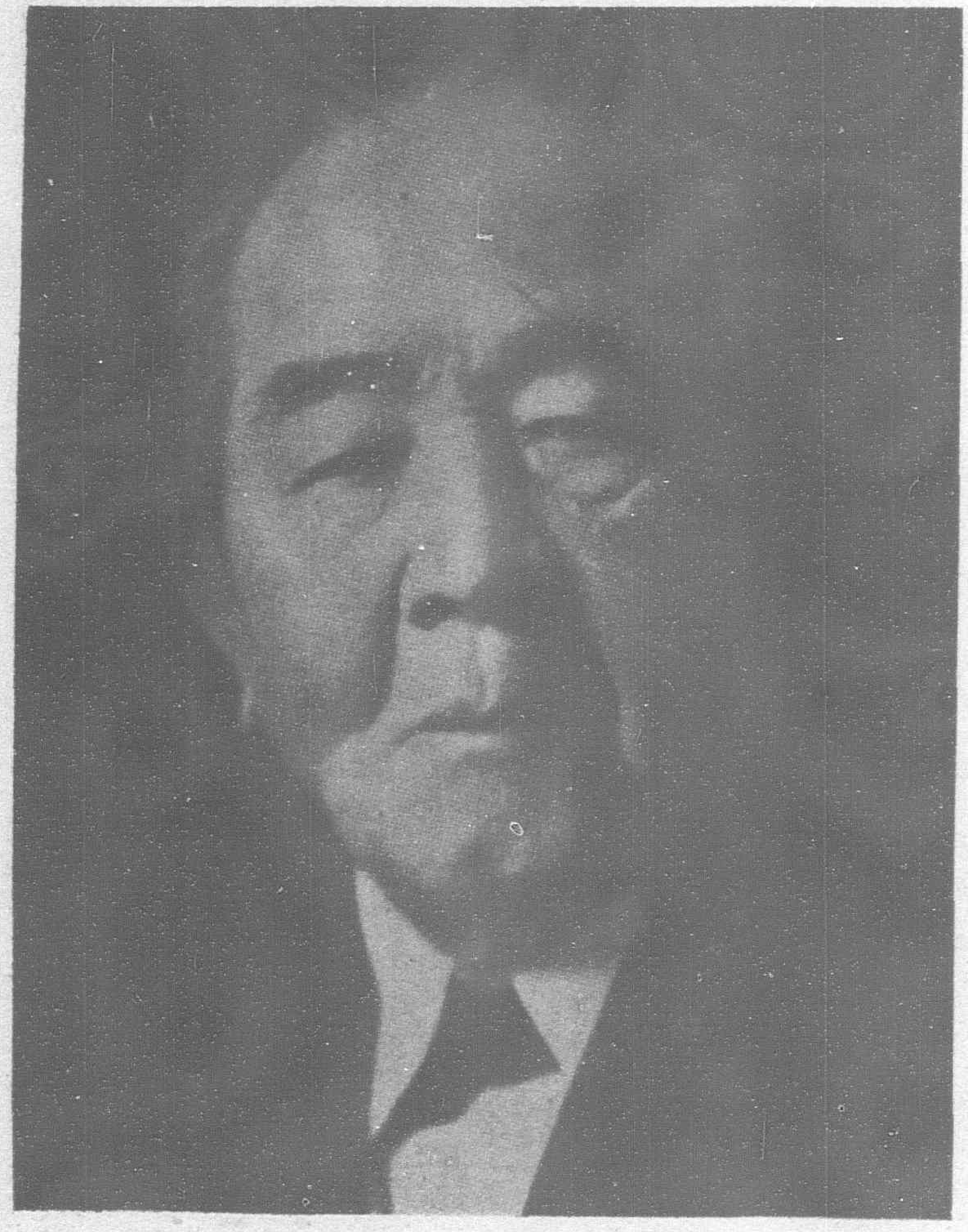
(Continued from page 2).

Again, we repeat. Stay out of it! We have shoved the racial issue into Asia. There is no good reason why the youth of America should be called upon to fight Japan in the Pacific over the sanctity of treaties, which admittedly are incomplete, for the sake of a nation of five hundred million people whose disorganization and failure to create a proper government, invites the clash.

There is just one sensible thing for the United States to do. Keep our powder dry; expand our battle fleet to its treaty limit; fortify the Canal, the Pacific coast and Hawaii; get out of the Philippines as soon as we can with dignity; build airships and airplanes; keep prepared and ready at any moment to defend our own land against the pressure that will be brought to open our doors to the hordes of Asia. Get back to the Roosveltian philosophy: "Speak softly, and carry a big stick." If we are wise we will not incur the enmity and hatred of Japan. The Japanese are our friends, as well as the Chinese. The Japanese do not want to fight America. Their traditional foe lies in the other direction. Some day they will have to fight the Slav. We have forced Japan into Asia to seek her destiny. Let her find it in her own way.

Viscount Shibusawa Passes

JAPAN'S "Grand Old Man," Viscount Eiichi Shibusawa, has passed on. Death has taken the man, but his memory lives, and the story of his career, which is the history of the rise of Japan to the status of a great world power, remains as a shining record in the annals of the nation. Neither statesman nor soldier, he was one of the world's great leaders, and his life span of ninety-one years was filled with service to his nation and love for his fellow men. Known affectionately as "the prime minister of the people," in the hearts of his fellow men he took rank as the first citizen of Japan and his kindly influence extended overseas to win the respect and admiration of Americans and Europeans who mourn his loss.



Japan's "Grand Old Man," Viscount Shibusawa

Viscount Shibusawa's life stands as an epic of achievement, the more worthy of praise because of his humble origin and the struggle of his earlier years. He was born in 1840 in a small village near Tokyo, then the capital of the Shogunate. As a youth he was studious and ambitious. The coming of Commodore Perry and his black ships, knocking at Japan's doors, aroused the youth's fiery spirit and he was among those who opposed the coming of the strangers. The lad of nineteen would have none of the "barbarians." He studied under classical instructors at Yedo, now Tokyo, and became an expert fencer before leaving for Kyoto, the Mikado's capital, where his talents were recognized by the lord of the Hitotsubashi Clan, one of the three principal branches of the Shogun's family.

In time he was made an official in the Shogunate Government at Yedo and in 1867 he sailed for France to study western sciences and institutions. On his return a year later he found the era of the Shoguns closed with the Restoration having taken place in his absence. He entered the Department of Finance under the Imperial Government to become soon afterward Junior Vice Minister of Finance and Chief Inspector of Trade and it was in this period that he supervised the organization of the first joint stock companies in Japan. After leaving the service of the Ministry he devoted the middle part of his life to commercial pursuits and this was succeeded by his altruistic services in philanthropy and international goodwill which occupied his later years.

A change of viewpoint was brought about in the life of Viscount Shibusawa and a friendship was formed as the outcome of his contact with the first American Minister, Townsend Harris. It was then that he first discovered that his anti-foreign preconceptions were not supported by facts and then followed his gradual, reluctant admission—first to himself and at length to others—that his preconceptions were really prejudices. After that came his complete conversion to a world philosophy of mankind's true greatness when freed from bias of race and standing on the broad foundation of common humanity.

Viscount Shibusawa freely acknowledged America and Americans as his teachers and perhaps one of the greatest sorrows of his life came from the bitter disappointment with which he received the news of the passage of the American immigration act of 1924 when European nations were placed on a quota and Japanese exclusion was enacted. He expressed again and again the hope that he would live to see this injustice rectified. He was not able to attend the 1929 meeting of the Institute of Pacific Relations at Kyoto, but a letter from him was read there expressing his deep concern and injured feelings resulting from the action.

It is not enough to say that Viscount Shibusawa was one of the Empire's first captains of industry and finance, for he was also one of her greatest leaders and philanthropists, serving his country and countrymen without thought of reward, emptying his purse in the cause of charity, and although he held no government posts in later life he was a powerful factor in the Government, striving to advance the cause of Japan in economic and political relations.

He was the founder of the Empire's early financial organizations and his life is a cross-section of Japan's financial and industrial history, for he organized the Chamber of Commerce in Japan, founded the first national bank of Japan in 1873, was a leading figure in the formation of the Japan Mail Line and the expansion of the nation's maritime efforts. The development of the cotton spinning industry in Japan is due largely to his initiative, as well as other manufacturing enterprises such as silk weaving, hemp and rope mills, concrete plants, sugar refining and affiliated projects of the modern age. In co-operation with Government authorities he sought to improve Japan's natural production and resources by reclamation work and harbor construction, by improving agriculture and by introducing artificial fertilizers and high grade cattle and stock breeding.

Nor were his activities confined to Japan alone, for he was promoter of Korean railways, electric light and telephone systems in Manchuria and other projects. Until his retirement from business activities, he was actively connected with more than forty industrial and banking firms either as president or director.

In 1900, a peerage of the Empire was conferred upon him by the Emperor of Japan. It was in recognition of his great services as a financier, philanthropist and industrial leader, giving untold impetus to the economic development of Japan, that this award was conferred, setting a precedent in Imperial awards, for never before had a business man been so honored.

On his last visit to San Francisco, Viscount Shibusawa was given a special fete of honor by the Chamber of Commerce when he was presented with a golden scroll setting forth an appreciation of his splendid work in behalf of international relations.

There is none to take his place, for in his greatness he was unique, a man whose whole efforts were directed toward the progress and happiness of mankind. His life work is enduring and ageless.

Japan's Aims in Manchuria

Clear-Cut Statement is Made Before Diet by Foreign Minister, Mr. Kenkichi Yoshizawa

To insure peace and order in Manchuria with open opportunity to all for economic development is the aim of the Japanese Government in the present crisis. This is the simple, straight-forward declaration of Mr. Kenkichi Yoshizawa in his initial address as Foreign Minister before the Imperial Japanese Diet. In the course of his speech the Foreign Minister reiterated with new emphasis that Japan has no territorial ambitions in Manchuria and intends to uphold the principles of the Open Door and all treaties relating thereto.

The former Japanese Ambassador to France, who distinguished himself as the Chief Japanese delegate through the recent trying sessions of the Council of the League of Nations at Geneva and in Paris, pointed out that the Manchurian issue is the most important question confronting the Japanese Government, presenting a problem engaging the profound attention of the entire world. His address in full follows :—

Kenkichi Yoshizawa

"It gives me much pleasure to lay before you my views on the outstanding diplomatic questions confronting the Japanese Government to-day. The most important of these, which not only affects us most profoundly, but engages the attention of the entire world, is the Manchurian Affair. China being Japan's neighbor, she always stands, both economically and politically in an intimate relationship with this country. In regard to Manchuria, through historical and geographical reasons, political considerations must become of preponderant interest. It is beyond any argument that the welfare of Manchuria is of the greatest consequence to Japan. More than a million Japanese subjects are in Manchuria and we possess there, in connection with the leased territories, railways, mines, etcetera, and vitally important rights and interests secured either by treaty or contract.

"In recent years, the Chinese authorities, ignoring the historical fact that the present development in Manchuria is entirely due to Japanese efforts, and taking advantage of our complaisance, have pursued an oppressive policy towards the Japanese and again and again set at naught treaty rights and interests. Protests and warnings from the Japanese Government have availed little. Thus, the situation in Manchuria had become, politically, more and more disquieting and the menace to our position increasingly grave. The patience of the Japanese nation had been tried to the breakingpoint when the railway bombing incident suddenly occurred September 18 last year, precipitating a collision between the Chinese and Japanese troops and later leading to the developments which are well known to all.

"Manchuria holds the key to the peace of the Far East. That was true before the Russo-Japanese War and is even truer today. In the past the Japanese Government has always done everything possible to prevent Chinese civil commotions spreading into Manchuria because we possess there rights and interests, rendering maintenance of peace and order in Manchuria absolutely essential. Thanks to our untiring efforts, Manchuria remained free from the constant turmoil in China Proper and was turned into a land of peace and prosperity. But for the Chinese misconduct in these late years and the Chinese disregard of treaty and contractual obligations, I believe the incident of last September would not have resulted in the present complications. And inasmuch as we are chiefly accountable for the past maintenance of peace in Manchuria, so our responsibilities in this respect will be enhanced rather than lessened in the future.

"I desire to add a word in this connection and to make clear that Japan harbors no territorial designs in Manchuria and will uphold the principles of the Open Door and equal opportunity and all treaties relating thereto. Japan desires only to secure peace and order in Manchuria and to make the region safe for Chinese and foreigners and open to all for economic development.

"Turning to the conditions in China Proper, anti-Japanese agitation has been carried on there for many years in the past without intermission except brief intervals of comparative calm which were followed by agitations of increased violence and intensity. It should be noted that these agitations represent not only economic movements, as in the case of boycotts against Japanese goods, but bear a psychological aspect, as may be inferred from the insertion of anti-Japanese sentiments in public school text books. However, there exists unmistakable evidence that this movement is actively promoted by unofficial organizations such as various anti-Japanese societies under the direct or indirect guidance and encouragement of the Chinese Government but against the free will of Chinese merchants and the general public.

"Besides, not a small number of Chinese actually make a profession of agitating against Japan.

"Since the advent of the present situation in Manchuria, the anti-Japanese movement has begun to display unpleasant symptoms and a number of regrettable outrages have been perpetrated. Compared with the complete protection afforded to Chinese nationals by Japan, the indescribable persecution of Japanese nationals in China presents a glaring contrast. The truth is that the foreign relations of China have often been sacrificed to the machinations of her domestic politics during the past years owing to her civil factional strife.

"The anti-Japanese movement undoubtedly derives its origin from China's domestic politics. I believe that the hostile attitude of the Manchurian authorities in the period immediately preceding the recent incident is also traceable to the same source. In brief, it is undeniable that China's civil wars or domestic politics have exerted a most harmful influence upon China's foreign relations and Japan, by being her nearest neighbor, has suffered more than others.

" Thus, unfortunately. Japanese relations with China have come under the influence of the complex internal and external relations of the latter country. It is to be apprehended that some time must elapse before the necessary adjustments can be effected to bring back the relations of the two countries to a normal basis. The Manchurian incident having been caused, we were compelled to resort to immediate self-protective measures, and the anti-Japanese movement is due to misguided views entertained by the Chinese. The solutions of the issues involved, therefore, must await a complete change of heart and reversal of policy on the part of China. However, I am convinced that the Chinese people as a whole, and their enlightened leaders, are not hostile but rather in their hearts amicably disposed towards Japan. We need not entertain over-pessimistic prospects for the restoration of normal Sino-Japanese relations. Undoubtedly, it would be in best interest of the two countries that they should love and respect each other and that friendliness should rule in any strained relationship which is merely a passing phenomenon.

" The Manchurian Incident, at its outset, caused considerable shock to the League Council and the Assembly which were then in session at Geneva. On September 21, the Chinese delegate requested the Council in accordance with Article XI of the League Covenant to take cognizance of the matter and the question has been officially made the subject of investigation by the League Council. Since then, the Council, has held three sessions and passed two resolutions.

" On the other hand, the United States of America, though she is not a member of the League, acted in concert with that body. Evidently because she is a signatory of the Anti-War Pact and the Nine-Powers Treaty America is deeply concerned over the situation in the Far East. The Japanese Government has exercised its utmost efforts to make clear Japan's position to both the League and America. Although there have been occasions when the present incident seemed to lead Japan to more or less delicate relations with the League and America, we have succeeded by careful and complete presentation of the case in bringing both to a better appreciation of the Japanese position and Japan's vital Manchurian interests.

" Towards the Soviet Union which steadily holds an impartial attitude and has not interfered with the present affair. I desire to express the satisfaction of the Japanese Government.

" With regard to the Disarmament Conference scheduled for February 2, this Government has formed definite plans and given its instructions accordingly to the Japanese representatives. This most momentous conference, being the first one whose deliberations will cover the entire armament of the whole field involving land, sea and air forces the world is eagerly anticipating its outcome. The Japanese Government will strive to carry its points, but in all events, I earnestly hope the conference will yield tangible results, alike rational and equitable, by which it may contribute to the establishment of permanent peace in the world.

" The spirit of progress, which was manifested when Japan was first thrown open, governs, as ever, our national policy. To ' seek knowledge in the wide world ' as expressed in the oaths taken by the Great Emperor Meiji is a living creed of our people. The ideal of our diplomacy is, while maintaining just Japanese rights to work in harmony with all countries and to give the Japanese nation a share of the benefits of universal culture and enlightenment. It is with that ideal I hope to work and help to promote the interests of the nation and the happiness and welfare of the Japanese people."

The Great Mistake

A Review of " America's Siberian Adventure," by General William S. Graves, with a Foreword by Newton D. Baker. Published by Jonathan Cape and Harrison Smidth Inc., New York

In clarifying the mystery surrounding America's Siberian adventure, General Graves makes it sufficiently clear that President Wilson's rejection of the recommendations of his highest military advisers was based on purely political motives which had no relation to the rescue of the Czechs, the protection of the rights of the Russian people, the war plans of the Allies, the policy of his State Department or any of the reasons advanced to justify this extraordinary use of the army to support a diplomacy whose objects could not be revealed to the American people. General Graves might have made his point much clearer by including the testimony of General Tasker H. Bliss, America's representative on the Supreme War Council of the Allies. We have not before us the Hearings of the Senate Committee which investigated the conduct of the war, but recall that when General Bliss was requested to explain the reasons for our Siberian adventure, his answer was to the effect that ; **" this was the only instance during the whole war where President Wilson refused to be guided by the counsel of his highest military advisers."**

The inference conveyed by General Bliss that the motives and reasons for the dispatch of American troops to Asia without a declaration of war was an exclusive Executive secret, is strengthened after reading the straightforward, fearless testimony of General Graves, who expresses the same conclusion in somewhat different but equally unmistakable words. In summing up, he says :

> " I was in command of the United States troops sent to Siberia and, I must admit, I do not know what the United States was trying to accomplish by military intervention. As has been clearly shown, one must discard the statements of the United States, in August, 1918, that troops were being sent to rescue the Czechs from the Austrian and German prisoners, who were reported as having been released from prisons and were organizing with the object of getting the military supplies at Vladivostok, taking the Trans-Siberian Railways and sending the supplies to Germany. These reports were untrue."
>
> " The action of the State Department representatives in helping Kolchak, whose sole object was the destruction of the Soviets, justifies the conclusion that the United States was a party to the efforts to overthrow the Soviets, as Kolchak was unquestionably fighting them."
>
> " The Agreement entered into by President Wilson and the Allies on June 12, 1919, 'To assist the government of Admiral Kolchak with munitions, supplies and food, to establish themselves as the government of all-Russia,' also justifies this conclusion."
>
> " It will be noted that President Wilson does not agree that United States troops would be used to help Kolchak destroy the Soviets. In substantiation of this belief that President Wilson did not intend to use United States troops to help Kolchak, he stated on June 26, 1919, just three weeks after he agreed to help him with munitions, supplies and food, in reply to a Senate resolution ; ' The instructions to General Graves direct him not to interfere in Russian affairs.'
>
> " There is no question the War Department construed the American policy in Russia, which constituted my orders, as meaning that the American troops were not to take sides in the interal conflicts....It is my personal belief that this policy was followed because no other course could be adopted without the Executive running counter to the provisions of the Constitution of the United States, by making war without a declaration of Congress."
>
> " If the American troops were not to be used in support of the policy followed by the State Department, why were they sent to Siberia ? If the United States had been deceived as to the menace from German and Austrian prisoners and had sent troops to Siberia to block this menace, why were they not sent home after the Armistice, instead of being kept in Siberia with nothing to do from November, 1918 to April, 1919, the date of the Railway Agreement ? "

General Graves makes it clear that the ostensible reasons for sending American troops to Siberia had no basis in fact; that these troops never engaged in fighting the "Red Armies" before or after the Armistice; that no state of war existed which would justify the President in sending troops without a formal declaration of war by Congress; that the whole adventure was a mystery, a futile waste of American energy, money and prestige. Even after reading Mr. Newton D. Baker's defense of policies and ideals that influenced President Wilson to send the expedition it does not change the fact that this chapter in American military history stands out as a highly dangerous and provocative intervention in a part of the world where the United States cannot by the wildest stretch of the imagination have any material or political interests. President Wilson's instructions placed our forces and their commanding general in a most unenviable and embarrassing position, giving rise to constant bickerings, irritation, strained official relations with our Allies and the circulation of slanderous propaganda against their efficiency, their valor and, at times, even their patriotism. General Graves had to bear the brunt of this unworthy campaign. His book is a belated attempt to defend his actions and keep the record straight.

General Graves seems to have been carefully selected to undertake a job that called for a cool head, self-reliance and a capacity to stick to instructions and enforce them under the most severe provocation and pressure to depart from their letter and spirit that any American commanding officer has ever been called upon to face. Had he allowed himself to be influenced by the other Allied commanders or by State Department interference, pressure of public opinion, editorial vituperation or the course of events in Siberia, General Graves would have been made the scapegoat for the certain explosion that would have followed.

President Wilson rejected the advice of General Bliss, his highest military adviser, for co-operation with the Allies to destroy Bolshevism in Siberia and then, after inducing the Allies to accept his own ideas and terms, ordered the army to participate in an adventure that openly clashed with the war aims and strategic security of his associates. A ticklish job for a straightforward fighting man, who found himself from the moment he landed in Siberia an object of suspicion, at cross-purposes with the Allied commanders, incurring their ill-will and at times their open hostility, making difficult, if not impossible, those cordial relations and frank interchange of thought that should have prevailed. There were times when the United States was brought perilously near being plunged into actual warfare with its Associates over this inexplicable conflict of political aims. Fortunately for the Army, for himself, his officers and his men, General Graves adhered tenaciously to the letter of his instructions, for, as General Leonard Wood told him on his return from the Far East, that if he did not have copies of his papers he would "be torn limb from limb, because he did not take part in fighting bolshevism."

Might not the solution to the mystery be found in the following paragraphs from General Graves' book:

> "After my trip north, I was forced to the conclusion that Japan was indulging in both political and military maneuvers, and it soon became apparent that Japan was not the only nation working at cross-purposes with the announced policy of the United States; it is known that England was not only willing but as early as March 1918, had asked Japan to occupy the Trans-Siberian Railway. She gave as a reason for this request; 'That Japan could control the only line of communication, by which aid could be extended to anti-bolshevist movements in South Russia.' In this connection, the following suggestions were made by the military representatives of the Supreme War Council:
>
> **"If Japan demands some compensations for her efforts it may be necessary to acquiesce in her occupying a small part of Eastern Siberia. It is probable in any case she will take part of Siberia, but this may prevent her from looking for expansion elsewhere."**

General Graves brings out that the original reason for Allied intervention in Siberia was Great Britain's fear of the rising power of Russia as manifested in the Russian penetration of Central Asia and in the Far East. France, on the other hand, looked for material economic advantages and came to an understanding with Britain and agreed to an actual dismemberment of Russia on December 23, 1917, Japan, as Britain's Ally, was willing to take over the task of defending their mutual interests, protecting the war materials stored at Vladivostok and guarding the railways east of Baikal, but was not willing to send her troops west of Baikal, if she was to bear the expense of such movement. The evidence substantiates the statement that the matter was fully discussed by the Supreme War Council of the Allies and agreed that Japan should assume this obligation and be compensated for it by some territorial acquisition in Eastern Siberia, **"in order to prevent her from seeking expansion elsewhere."**

In March, 1918, three months after Great Britain and France had come to the agreement referred to, Japan requested permission of her allies to take over the Chinese Eastern and Amur Railways as well as Vladivostok, if they considered it necessary to occupy eastern Siberia. For six months prior to the dispatch of American troops to Siberia, England, France and Japan through diplomatic channels and through the Supreme War Council, applied such pressure, as they could, upon the United States to consent to some form of military intervention in Siberia. The Supreme War Council wanted troops in Siberia to fight the Bolshevists, but President Wilson opposed any intervention along these lines, putting his judgment against that of all the Allies and their Supreme military experts.

In view of this, it is difficult to understand just what Mr. Newton D. Baker (President Wilson's War Secretary) means when he says in the Foreword to General Graves' book:

> **"Even the soldiers of a Democracy cannot always understand the reasons back of strategic situations. Political and military reasons are worked out in cabinets and general staffs and soldiers obey orders."**

The evidence in the pages of General Graves' book clearly reveals that there was no strategic situation to deal with and that the political reasons were not worked out in the cabinet, unless by the cabinet he means the President and the secretary of war, to the exclusion of the other members. The constant conflicts over policies between the State Department and the General commanding on the ground in Siberia, would indicate that the State Department was not taken into the full confidence of the Executive. On the other hand, the general staffs of the United States, Great Britain and France, represented on the Supreme War Council by their ablest military minds, and fully supported by the British and French cabinets, had decided that it was essential to the success of their cause that Japan be requested to take over her share of the war in her own particular sphere and that she be compensated for it by the cession of some part of Siberian territory. Giving greater heed to the reports from Moscow as to the reaction in Russia against permitting Japan to take over this duty, President Wilson blocked the plans of his war associates and declined to take the country or Congress into his confidence.

The Allies wanted to fight Bloshevism and were willing to compensate Japan for helping them to do this. President Wilson was not willing to fight Bolshevism or interfere in any way with the internal affairs of the Russian people or become a party to any agreement that would enable Japan to get any territorial advantage out of the war at the expense of Russia. In seeking the real reasons for the causes which led to Allied intervention in Siberia, General Graves admits:

> "That one of the main reasons, if not the main reason, was carefully and designedly kept secret. The Allies were much disturbed because the Soviets had extended their authority throughout Siberia long before the decision to intervene, and it is evident England, France and Japan went to Siberia with the distinct idea of fighting bolshevism but, for some reason, they tried to cover up this design by advocating the formation of an Eastern front, which they also hoped could be accomplished. **It is very significant that all the governments taking part in intervention in Siberia considered it unwise to let the world know that they intended to try to destroy the Soviets. Definite reasons for concealing this objective are, generally speaking, still unrevealed to the public."**

After reading what General Graves has to say about his instructions, and the way he carried them out, there is no great secret about that now. The Allied Governments were obviously forced to surrender their original plans in order to overcome the long drawn-out opposition of President Wilson and, when they finally came in under his invitation and declaration of intentions and then discovered that the American general and his forces were on the ground for no other purpose than to see that they lived up to the strict letter of their agreement with the United States and, that the American general carried out his instructions until Kolchak was overthrown and the Bolshevists had imposed their rule over all Siberia ; why should they now explain their defeat ?

For, the facts revealed by General Graves and supported by other equally competent authorities, show that the Allied powers through their war cabinets and their Supreme War Council were determined to fight the spread of bolshevism and were willing to entrust this part of the war to Japan and compensate her in the same manner that they themselves expected to be compensated, and were compensated at Versailles. Determined that the United States would not interfere in the internal affairs of Russia or be a party to any dismemberment of her territory—**in Asia**—Wilson successfully opposed this plan for several months until the rapid spread of bolshevism forced him reluctantly to give way to the Allied pressure. By rejecting their plans, taking the initiative upon himself and issuing the invitation for intervention in the name of the United States, he assumed responsibility for the expedition under promises that safeguarded Russia from partition in the East. Justifying to himself that he was doing the right thing President Wilson set at naught the plans, policies and desires of his war associaters and forced his own policies upon them as a condition to America's consent to and participation in the expedition. Under such circumstances and play of cross-purposes, there was bound to be illfeeling, friction, misunderstandings, recriminations and efforts to force our hand. It was a foregone conclusion that Britain, France and Japan would endeavor to carry through their ideas under cover of the agreement and create a situation that would compel the American General to co-opoerate with them, especially when at all times their program had the full sympathy and support of the State Department. It was also to be expected that in trying to force General Graves around to their viewpoint, many acute situations would be created, for, whatever may have been the declared objects of the expedtion, our partners confidently assumed that they were merely advanced to screen the real reasons from the public. Japan, especially, who was vitally affected and saw herself being deprived of her right to defend her interests and at the same time benefit as a result of the war, would exhaust every legitimate means, to circumvent the declared reasons and in doing so, invite upon herself the burden of American criticism and resentment. This is exactly what happened and to a point where General Graves unduly criticizes the Japanese in pursuing their own aims despite their agreement with the United States, an agreement Great Britain, France and Japan were forced to accept at the eleventh hour as the only hope of combatting a menace to their interests.

In severely condemning Japan for the atrocities and murders committed by her Cossack allies, General Graves forgets that amongst themselves or in dealing with other Asiatics, such barbarities are inherent in the Russian military character. Semenoff, Kalmakoff, Rozanoff, and others of their ilk, were simply true to type, adhering to the traditional military law of the Cossack. One has only to recall the pogroms in European Russia or the Russian campaigns in Central Asia to understand that their system is to hit hard, kill off the fighting males, strike terror to the hearts of the others and then, treat them kindly. Every Asiatic understands this in dealing with Russia. When they are on the winning side they adopt the same pitiless methods. The excesses of Semenoff and others pale into insignificance before what followed when the Reds had it all their own way. This explanation is not in extenuation, but a simple recognition that warfare in Asia has always been characterized by barbarous massacres, cold-blooded murders, outrages and other atrocities which have no parallel in the West. Japan openly supported the Cossack ; Great Britain and France, the Government of Kolchak. The American State Department, supported by public opinion in the United States, openly backed Kolchak ; the American Red Cross Society supplied his armies with clothing and food ; the American War Department sold him arms and munitions and an American army helped to guard his line of communication. The only one who was not helping Kolchak or some other anti-bolshevist force was General Graves, and he was carrying out orders. Kolchak, Semenoff, Kalmakof, Deniken, Lenin, Trotsky, Russians, Cosacks, all, why make a distinction in their methods of waging war ? If Japan is responsible for the crimes of Semenoff, Kalmakoff and their Cossacks, then Britain, France and the United States are equally responsible for the similar crimes of Kolchak. Who was responsible for the monstrous atrocities which followed the withdrawal of all the Allied troops from Siberia ? General Graves, a high-minded, courageous and humane fighter, a typical American, was justly shocked and righteously indignant at what he saw in Siberia. The moral of it all is, that if the United States, ever again gets mixed up in warfare in Asia with any troops other than the Japanese, they must expect to witness horrors, mutilations and other atrocities upon their wounded and their prisoners, that will make them react in the same manner that compels the British, Japanese and other chivalrous fighting men who have looked upon their dead, to give no quarter to the other side. Human nature has not changed in Asia since the days of Genghis Khan and Tamerlane. If General Graves would read the reports of the civil wars in China, he will understand that this is true.

If we have any criticism to make of General Graves' book, it is that he failed to give sympathetic consideration to the legitimate aims of the Allies which were set aside and ignored in the official statement given out to the world to explain the objects of the intervention. General Graves admits that the real objects had been designedly concealed, yet all that he could see was that in supporting Kolchak, the Allies were taking sides and violating their agreement with the United States. He also saw that the Allies had the full support of the State Department and that even the American Red Cross Society was supplying Kolchak with clothes, food and other necessities. It all irritated him. It was evident on all sides that there existed a unanimity of policy and complete understanding with the sole exception of the orders communicated to General Graves, and which were never countermanded. Graves was the rock upon which was hurled the waves of Allied resentment, departmental jealousies and international intrigue. Had the rock moved under this terrific hammering the United States would have found itself at war in Asia without the knowledge or consent of Congress and over issues that could not be revealed to the American people. As it was, hostilities were only narrowly averted on several occasions. That General Graves stood firm is everlastingly to his credit. There are few men similarly placed who could have kept their head and withstood the pressure. The American people owe him a debt of gratitude.

Our intervention in Siberia on our own terms and refusal to play the game with Great Britain, France and Japan is largely responsible for the aftermath. Our inaction saved Siberia for Bolshevism and we then withdrew with no thought of the consequences, leaving Britain and Japan to face the music alone. Had the advice of the Supreme War Council been followed, the Soviets would have been confined west of the Urals and the Red menace to India and the Far East averted. This mistake was followed up at the Washington Conference by breaking down the Anglo-Japanese Alliance, which had stood for twenty years as the one guarantee of peace in the Far East, the one effective check against the aggressions and encroachments of Russia on the smaller and weaker states of Asia. To-day, as a result of these blunders, Great Britain faces the loss of India ; Mongolia is lost to China, incorporated in the system of Soviet Republics ; Sinkiang and Barga are headed the same way ; the Communists swarm all over China with the greater part of the Yangtsze Valley in their possession. The security of Japan and her existence as a nation is placed in jeopardy. Unless Japan stands firm at this juncture over her treaty rights in Manchuria and the right to apply the law of self-defense, she is finished as a great power and the last obstacle to the complete sovietization of Asia will be removed.

Had the original plan of the Supreme War Council been carried out, Japan would have stood guard at Irkutsk or Chita against the sovietization of Mongolia and a large part of China and the pressure on India would have been relieved. Japan might have been compensated by territory in Eastern Siberia that would have provided her with an outlet. To deny her this reward after biting big chunks out of western Russia in order to create a sanitary cordon for the protection of the rest of Europe against the spread of bolshevism, is, to say the least, inconsistent. In this, President Wilson was not animated by any love for the Russian people or any regard for the integrity of their territory, so it must be inferred that for reasons of his own, reasons which his State Department did not endorse, he refused to listen to any arrangement that would enable

Japan to expand, preferring that the people of the United States take on their own shoulders the solution of the racial problem rather than permit the issue to be settled on the plains of Central Asia, where it belongs.

The United States had sense enough to decline the Mandate over Armenia, thanks to the report of a mission of hard-boiled realists who had no illusions about what it all meant. Had we accepted this innocent looking package of dynamite, an American army would be defending Britain's empire in India against any Russian advance from that direction and the nation would have been maintained in constant trouble with the Bolshevists and their Communist successors. Yet we deliberately thrust ourselves into the very center of the same explosive situation in Siberia, refusing to take any action ourselves, holding Great Britain, France and Japan to the strict letter of their commitments with the United States, tieing their hands while the menace to their security was permitted full scope to develop without opposition. As a result of this conflict between high ideals and the basic strategic policies and problems of other countries, Britain must now fight to retain her hold over India while Japan must make a stand for her right to exist. Bolshevism, Communism, Liberalism, Democracy, the right of the Russian people to govern themselves under any name they choose to call it, cannot and will not modify by a hair's breadth the fundamental policies of their rulers or check the steady, relentless, onward march of the Slav towards his ultimate goal. Only by the use of force just as relentlessly and ruthlessly opposed to the attainment of these aims, can the rest of Asia be saved from passing under the yoke of the Muscovite.

We are not cynical or un-American when we say that American policy in Siberia as outlined in the narrative of General Graves and our subsequent well-meant efforts to preserve the *status quo* by peace and other pacts, without giving due consideration to the causes which make for world unrest, will eventually pit the United States against Japan. After reading the Foreword to General Graves' book and connecting the words fo Mr. Baker with his recent indictment of Japan and, remembering that Mr. Baker is a candidate for the Democratic nomination for the presidency, in the event he is nominated and elected, the nation must prepare itself for a revival of policies that found expression in our futile Siberian expedition.

We are not critical of Mr. Baker for expressing what he believes to be right. He may be right. One has only to read the following extracts from his Foreword to understand the motives which largely influenced President Wilson to send an American army to Siberia, motives which have Mr. Baker's full endorsement :

> . . . "If the Siberian Expedition was in fact unjustified and if it really failed to accomplish substantially helpful results, this much is true of it—it was justified by conditions as they appeared to be at the time, it refrained from militaristic adventures of its own, it restrained such adventure on the part of others, and it created a situation which made necessary the withdrawal of all Allied forces from Siberian soil when it was withdrawn, thus making impossible territorial conquests and acquisitions on Russian soil by other nations whose interests in the Far East might easily have induced them to take over for pacification, and ultimately for permanent colonial administration, vast areas of Russia's Far East. . . . .
>
> . . . . . "If there was a defect of affirmative achievement, history will find benefits from the negative results of American participation in Siberia ; things which might have happened had there been no American soldiers in the Allied force, but which did not happen because they were there, would have complicated the whole Russian problem and affected seriously the future peace of the world."

All of which is undoubtedly true, but in making impossible territorial acquisition by other nations at the expense of Russia and complicating the whole Russian problem as it appeared at that time, our intervention in Siberia undeniably made possible the solidification of power in the hands of the Bolshevists who immediately started to carry forward the traditional Muscovite policy of expansion and annexation of weaker Asiatic states where the former régime left off. Whether the future peace of the world can be better assured by permitting Communist Russia a free hand to pursue her policies in Asia, which means her ultimate domination of the continent, the collapse of the British Empire and the extinction of Japan as an independent nation, or whether it will be best to permit Japan to work out her own destiny in opposing this menace and supporting her in maintaining the balance of power in Asia, is the real issue we now have to face. There is bound to be a legitimate difference of opinion amongst Americans in regard to this. At any rate, the basic issues involved are of such an explosive nature as will sweep aside all American objections and legal obstacles and compel Japan to assert her right to exist, whether or not the rest of the world approves or supports her.

Had Mr. Baker stopped to consider that the crisis in Manchuria is a direct result of forces set in motion by the reluctance of his administration to recognize the right of other nations to defend themselves in their own way against the Bolshevist menace in Asia, he might have been more lenient in his denunciation of Japan. Before condemning Japan for resorting to self-defense, Mr. Baker might explain more fully to the American people just what he means when he tells them they are not competent to understand the reasons they are called upon to lay down their lives to defend, reasons which may again send their sons across the Pacific to fight for ideals in Asia. If it means that we must fight to again make Asia safe for Bolshevism, then it is a foregone conclusion that we will fight alone, with no sympathy or support from those nations in Europe whose wishes we ignored and whose plans for defense we destroyed in order to impose our own ideas of what was best for them. After reading General Graves' book, and Mr. Baker's Foreword, the American people can begin to understand something of the reasons which may have influenced Great Britain and France in withholding full support to Secretary Stimson's invocation of treaties against Japan in the present Manchurian dispute.—G. B. R.

Foreign Investments in Japan

Foreign capital invested in going businesses in Japan, exclusive of holdings of bonds of companies managed by Japanese, is set at Y.102,000,000 in a survey published recently by the Tokyo *Nichi Nichi*. If Korea and other Japanese colonies are added, the total rises to Y.116,000,000.

America is the largest investor in such enterprises, with a total of Y.51,192,000. Britain comes second with Y.43,003,000, Germany is third with Y.4,049,000 and all other countries combined account for but Y.4,132,000.

The *Nichi Nichi* speaks of 13 companies which it declares are entirely foreign in capital. They include the Japan Ford Automobile Company, the Japan Columbia Graphaphone Company, General Motors Japan Ltd. and Dunlop Rubber. The total paid capitalization of these 13 concerns amounts to Y.45,948,000. In these American capital amounts to Y.13,100,000, British capital to Y.32,320,000 and German capital to Y.520,000.

In addition to the 13 the *Nichi Nichi* mentions 10 concerns jointly controled by Japanese and foreigners, but with the foreigners the more heavily interested financially. All these are under foreign management, the paper says. Total investment in these 10 amounts to Y.16,495,000, with American capital totaling Y.16,495,000, British capital Y.1,310,000 and German capital Y.38,000. These concerns, says the paper, include Japan Victor, Yokohama Rubber, the Nipponophone Company and the Godo Gramaphone Company.

The bulk of the concerns, however, are jointly owned by Japanese and foreigners but have Japanese managements. In this class the total investment is Y.38,375,000, of which America has Y.21,595,000, Britain Y.9,367,000, Germany Y.3,491,000, Sweden Y.3,300,000 and other countries Y.622,000. These companies are said to include Tokyo Denki, Nippon Denki, Japan Steel, Nichibei Plate Glass, Teikoku Seishi and Daido Match. The Swedish investment is in Daido Match alone.

The Y.14,000,000 invested in Japan's colonies is studied. There are four companies with total capitalization of Y.7,100,000 entirely under foreign management. Two companies, the Nippon Corn Products and Kentai Tea Enterprise companies, with combined investment of Y.2,500,000 are under joint Japanese and foreign investment, with the foreigners in control. Other foreign investments, in Ensuiko Sugar and similar concerns in the colonies, totals about Y.1,588,000, but none of them is under foreign control.

Unfortunately, the *Nichi Nichi* does not give the names of all the foreign concerns which it places in each of the categories mentioned above.

A Few Aeronautical Sidelights

In the preceding issue of *The Far Eastern Review* we called attention to the spread of anti-Japanese agitation in the United States as promoted by the Chinese secret societies which in connection with their regular boycott activities were raising a fund to educate and train three thousand aviators for service with the Chinese army. We begin to suspect that the Chinese anti-Japanese organizations in America are operating on the same principle of graft that characterizes these same associations in China.

From articles appearing in a number of American newspapers it seems that the plan of these Chinese war enthusiasts is to collect ten dollars from every Chinese in the United States to pay for the training of these students. It is a plan which if successful would net the tidy little sum of approximately a million gold dollars. When we remember that the 70,000 Chinese legally residing in the United States remit $25,000,000 a year to China, and add to that number probably as many more who have boot-legged their way into the country, we are able to discern a wonderful field for graft on the part of Chinese associations that have the low-down on their compatriots.

The following newspaper report taken from the *Baltimore Sun* of December 7, tells us how the actual training of these war birds is progressing:

> The war in Manchuria has given some of this country's flying schools a new idea.
>
> The idea is to train a lot of Chinese in this country to fly, then sell them airplanes and send them back to China to fly and fight for their homeland.
>
> Part of the plan, as rumored, is to collect $10 from every Chinese in this country, to pay for the training of 700 flying students. So far, the idea hasn't had much success.
>
> For one thing, most of the Chinese over here have been away from home so long they aren't much interested in a war over there.
>
> Then, too, China is divided into so many factions that it would be impossible for all the Chinese in this country to have $10 worth of enthusiasm about a war in the North.
>
> So up to now the training of Chinese flying students has been only scattered. One school in Portland, Ore., has had some success.
>
> It taught three Chinese to fly, and they are now traveling through the West raising funds to teach others.
>
> It has been rumored that the Curtiss-Wright Flying Service was behind the plan, but they say this isn't so.
>
> They will teach anyone to fly who is physically fit and financially qualified, regardless of nationality, but they have no concerted program to get Chinese students.
>
> And so it looks as though the plan to send 700 Chinese war birds back to fight for the homeland can be called a huge success if as many as a dozen ever get there.

But these anti-Japanese associations in America have gone further and have plastered the cities of the United States and Canada with alluring posters offering remunerative employment to aviators with the Chinese Government. The presence in Shanghai of a score of these deluded and indignant aces is revealed in an interesting article that appeared in the *Shanghai Times* of January 13, which is given as follows:

> Alluring posters offering highly-paid positions to experienced aviation pilots have been plastered round many of the cities of the United States and Canada. These have been responsible for inducing numbers of Canadian and American aviators to book passages for Shanghai, where they expected to find immediate employment by applying to the Chinese Government. Unfortunately the Nanking Government denies any knowledge of the posters and, while regretting the inconvenience to which the pilots have been put, are unable to offer any employment. The result is that a considerable number of pilots are now in the city, many of them literally penniless. In view of the fact that the posters stated that pilots should apply to the nearest Anti-Japanese Association upon reaching China, the source of the misinformation is apparent.
>
> Over a score of disgruntled American and Canadian aviators in Shanghai to-day are asking in no mild terms what this talk of a Chinese-Japanese war was all about. They also want to know where they can find the Chinese Government. A group of them recently returned from Nanking to report that they had interviewed 14 generals but had been unable to find any trace of the Government.
>
> During the past month, every ship from America has brought some of these aviators here. They did not come to fight the Japanese—merely to show the Chinese how to do it. The trouble now is not so much that the Chinese do not want to be shown how to fly; they simply are not interested. In the meanwhile, American and Canadian consular officials are wondering just what to do about these aviators, who seem to have been brought to Shanghai by false pretences.

Wanted as Instructors

> At the commencement of the Sino-Japanese dispute, in all the aerodromes of the Pacific Coast notices were posted to the effect that anyone qualified could earn $1,000 per month by going to China and instructing the Chinese Army in flying. Those interested were told to get in touch with the nearest Chinese anti-Japanese society.
>
> The notice did not state whether it was $1,000 Mexican or gold, but as none of the aviators had heard of Mexican dollars, that did not make any difference. It still seemed good. The anti-Japanese societies were flooded with applications. Those that were qualified with both licences and money enough to pay a fare to China were given a wonderful story.
>
> There were tales of great fleets of aeroplanes being built secretly in the United States and of China's crying need for trained pilots. It was explained to them that it would be a breach of neutrality for the Chinese Army to sign contracts with them in a foreign country, but they were assured that they would be given such letters of introduction that they would have contracts immediately on their arrival.
>
> So they came by twos and threes, filled with hopes of fame, fortune and adventure. They presented some of their letters of introduction. Everywhere they were greeted with the greatest politeness, but a certain lack of enthusiasm. They were told long stories concerning the change in government and the crying need for economy in the administration of the country. This left the aviators cold. "After all," explained one of them, "we didn't come 7,000 miles to talk about economy. We came here to teach flying."

Learnt about "Maskee"

> Weeks went by and red tape accumulated. The aviators' patience wore thin, particularly the one who had been assured that he would only need $25 after he reached Shanghai. In desperation, a group of them went to Nanking.
>
> In Nanking, they met 14 Chinese generals and discovered that, as a class, they were most approachable (the day after to-morrow). When they finally returned, they had learnt the meaning of "Maskee" and had lost all their illusions about fame and fortune in China.
>
> Some of them intend to stay, but others are getting back to their homes as best they can.
>
> One of them left in the *s.s. President Hoover*, but the same day, too, more arrived in the *President Jefferson*. They also brought word that there were 10 more in Seattle waiting to come out. The Canadians have had word that there are six more in Vancouver waiting to try their luck in China.

Mukden's Aviators

An inside picture of China's aviation force, revealing one of the reasons why the Chinese army flyers have failed to distinguish themselves in Manchuria, is contained in an article written from Mukden for *The Aeroplane*, a British aviation journal published in London. The "victorious return" of the Young Marshal's air force to their base at Mukden tells the story. Fifteen planes crashed on the way back, *and not a single pilot was hurt*. This is carrying out the traditional Chinese tactics of warfare along modern lines at a cost to the treasury that can be easily computed. Here is the article from *The Aeroplane*:

China Versus Japan

Those who are at all puzzled by the situation in Manchuria, and find confusion worse confounded by the argument between Japan and the League of Nations, may be enlightened by the simple straightforward narrative of a man on the spot. He writes as follows :—

"The cause of the trouble seems to have been due to several pin-pricks by the Chinese in the pants of the Japanese. They attacked and killed some Koreans, who retaliated. Then they killed a Captain bloke of the Japanese who was foolish enough to go right into Chinese territory. Banditry of course is always going on, and finally some Chinese dug up a bit of the Japanese railway in Manchuria.

"Without any warning the Japs marched into Mukden, at least into the Chinese town, for the Japanese have a very big concession there, shot up a few people, shelled a cavalry depôt, and generally raised merry hell. The Chinese just walked out. Fired by their success, at least we assume they were, the Japanese tried it on several other places with great success.

"Marshal Chang Hsueh-liang (small 1) was in Peking. He is the son of the late Marshal Chang Tso-lin, who was killed in a railway accident a few years ago, which although never proved, was attributed to the Japanese.

"Chang Hsueh-liang was, as you surmise, practically King of Manchuria. Although he recognized Nanking as the head of the Government his word was law in Manchuria. He never has been on good terms with the Japanese, and they have stated very definitely now that they will not allow him back in Manchuria. But if they shift out, what the hell has it got to do with them ? However, I suppose might is right.

"The 'Young Marshal,' as he is called, happened to be in Peking as he had not returned after his victorious scrap about two months ago with a rebel crowd south of Peking. Did I tell you the story of the victorious return of his Air Force ?

"After they won the battle (it happened to be a fine day, so they fought), all the machines that had taken part returned to Mukden, at least they started. It was a bad flying day, no visibility, but flushed with victory they headed for Mukden.

"Three got through, and the rest were reported as having forced landed O.K. Then trainloads of bits and pieces began to arrive at the Mukden aerodrome, so we inquired whether these were the captures from the other side. We then discovered that all the fifteen had crashed, and not a single pilot was hurt.

"So far as business is concerned in Mukden, there is nothing doing at the moment, and many firms have lost very heavily—for the money owed them by the Chinese will never be paid now. I cannot see anybody selling any aeroplanes for a long time to come.

"The Japs have certainly got a sense of humor. They have publicly announced several times that what they have done does not constitute an Act of War. When we asked them to hand over the aeroplanes, they referred us to Article so and so of War, which states that any goods, etc., taken over by a victorious army are their property.

"They are making a great show in Shanghai, parading up and down certain streets, armored cars driving about, and battleships in the river. It certainly looks very serious at the moment despite the League of Nations."

The same direct writer describes the handling of aeroplanes by the Chinese thus :—

"Seven Moths arrived at Mukden, or at the Mukden aerodrome. The boxes were all taken into a hangar, and a gang of coolies attacked them from all quarters with every conceivable instrument, crowbars, hammers, stone-breaking hammers, hacksaws and axes.

"Fuselages, wings, wheels, airscrews, struts, boxes of spares, were then all dumped in one heap. Then a Chinese checked them, even to counting the tools in the tool rolls. How he did it, God only knows.

"Then we started assembling. Perhaps the makers might realize if they knew this, why we asked them to label every part, and to show to which machine it belongs.

"Let's say No. 1234 fuselage. Well the wings are sorted out and the undercarriage, etc., and put aside for that machine. You turn your back and find they have put 1234 fuselage onto 1222 undercarriage.

"'No good,' say you. 'No can do. All same if you do not mind, we likee same parts all together.'

"'All right Can do,' say they,—and they start to change the labels !

"If you get too insistent, as soon as you go to lunch they will tear *all* the labels off.

"Still they are not too bad really, and they have a sense of humor, and if you can only make them laugh you can get quite a lot done."

Basic Problems

(Continued from page 5)

unethical journalistic methods. For the past decade these professional anti-Japanese agitators through their control of foreign news services have preserved their usefulness and ingratiated themselves with the Chinese by keeping alive the ill-feeling between Japan and America. The road to popularity in China is to be anti-Japanese and these agitators, war mongers and agents of Armageddon were embraced by the Chinese as their real friends and elevated to the status of advisors. Their counsel is largely responsible for the humiliation that has now befallen the nation.

The five hundred million Chinese will make no move to help themselves. No Chinese diplomat or statesman will now dare to break the deadlock by entering into direct negotiations with Japan for a solution of the Manchurian problem. China has won her point. She has thrown herself into the arms of the League and is on her knees before the United States pleading that we fight her battles for her. She babbles about her love of peace and abhorrence of militarism, yet this great peace-loving nation cannot settle its own political differences except by an appeal to the sword. In the past decade her pitiless armies have massacred more of their own defenseless people than were killed in the World War. She will prate about Japan's violation of treaties and forget it was her own refusal to recognize the legality of a treaty which precipitated the crisis with Japan just three months before the date Nanking had fixed, upon which it had been intended defiantly to confront the Powers with the violation of other treaties.

China will stop at nothing to avoid meeting Japan alone over the issue in Manchuria. She knows that if she persists in rejecting the 1915 treaty Japan will call her to account for her secret alliance with Russia in 1896 and demand the indemnity she was tricked out of at Portsmouth. China will drag the whole world down to ruin before she will admit her culpability for the Russo-Japanese War or recede from her position on the 1915 Treaty. As she did in 1904 so she will do to-day. She will sit on the side lines while other nations fight her battles and when the war is over and the world is exhausted and civilization is bankrupt, the prolific sons of Han will enter into their inheritance. "*Blessed Are The Meek, For They Shall Inherit the Earth.*"

Conservancy Work

It is announced at the Huai River Conservancy Board that conservancy work on the Huai River will be started this month. All preparations are ordered to be completed by the middle of January.

Resources at present in the hands of the Board for the work total $210,000 in cash and 10,000 tons of American wheat, General Liang Kuan-ying, Commander of the 25th Route Army stationed in northern Kiangsu, has also offered 7,000 of his troops as soldier-labor.

It is learnt, that in order to raise funds for flood-prevention work on the Yangtsze, Huai, and Yellow Rivers and the Grand Canal, Mr. Chuang Sung-fu, Vice-chairman of the Huai River Conservancy Board, has petitioned the National Government to impose a 30 per cent increase on the Rolled Tobacco Tax. It is estimated that an additional annual income of about $60 million may thus be obtained.—*Kuo Min.*

The Steel Industry of Japan

A SURVEY

By HAROLD HUGGINS

(Continued from December, 1931, Number)

TOTAL production of all kinds of bars, in both Yawata Steel Works and private mills for the three years 1928-30 was:

	Yawata	*Private*	*Total*
1930	152,933 k.t.	278,019	430,952
1929	207,441	381,679	589,120
1928	179,747	345,755	525,502

Considering the totals only, production in 1929 was 63,618 tons greater than in 1928, an increase of 21.1 per cent; but 1930 production was 158,168 tons less than in 1929, a decrease of 26.8 per cent; 1930 production was also 94,550 tons less than the 1928 production, a decrease of 17.9 per cent.

In each of these three years the Yawata production was about 35 per cent of the total, showing how well kept are the agreements concerning distribution of production.

The rolling mill equipment of the Japanese Steel Makers follows (not including equipment of plate and sheet rolling mills, which is given in another section). This list shows that there are 199 rolling stands in the mills of the 13 makers listed. There are 109 roughing rolls, and 90 finishing rolls. But the new installation at the Nihon Kokan's mill at Kawasaki, purchased from Krupp, is not included in this number.

Rolling Mill Equipment

Partly Manufactured Goods.

Company and Mill	*Type*	*Stands*	*Rollers* *Diameter*	*Rollers* *Length*	*r.p.m.*	*Maker*
Yawata Steel Works:			mm.	mm.		
No. 1 Ore Crushing	2 rolls	1	1100	2800	60	Gutehofnung
No. 2 ,,	,,	1	850	2450	0-120	Benradt
No. 3 ,,	,,	1	900	2200	85	Gutehofnung
Steel mill attached to the three mills above	,,	8	450	Main Shaft 950	49	,,
No. 4 Ore Crushing	,,	1	900	2200	77	Yawata
No. 5 ,,	,,	1	841	2228	77	Morgan
No. 6 ,,	,,	1	910	2200	0-100	Yawata
Steel Mill attached to the three mills above (4-5-6)	,,	6	3 stands 600 3 stands 550	Main shaft 1300	49	Demag
Steel Mill, etc.,	,,	6	450	1000	,,	(German)
Steel Piece Mill for Sheet Mill	,,	1	1016	2440	0-90	Mester
Mitsubishi Seitetsu K.K. Kenjihox Mill	,,	1	900	2200	77	Mitsubishi Zosenjo
Kawasaki Zosenjo K.K. Fukiai Sheet Bar Mill	Rough 3 rolls	2	460	2000		Krupp
	Finishing 2 rolls	4	450	875		,,
Bar Mills.						
Yawata Steel Works:						
Bar Mill	2 rolls	3	780	2200	120	(German)
No. 1 Large Shape Mill	2 rolls	3	680	2200	120	,,
No. 2 ,,	3 rolls	3	750	1727	104	Morgan
No. 3 ,,	3 rolls	4	863.6	2032	75	Mester
No. 4 Structural Steel Mill	3 rolls	3	600	1651	80	McIntosh
No. 1 Medium Size Structural Shapes Mill	3 rolls	4	480	1500	136	Krupp
No. 2 ,,	3 rolls	4	520	1600	123	Demag
Wire Materials Mill	Rough 2 rolls	8	370	Main Shaft 610	90	Morgan
	Finishing 2 rolls "Garrett" type	1	377	508	163	,,
		2	360	508	163	,,
		1	254	,,	396	,,
		1	273	,,	,,	,,
		1	282	,,	,,	,,
		1	317	,,	,,	,,
		1	254	,,	550	,,
		1	273	,,	,,	,,
		1	292	,,	,,	,,
		1	305	830	,,	,,
Mitsubishi Seitetsu K.K. Kenjiho Mill	3 rolls	3	720	1727	292	Mitsubishi Zosenjo
Nihon Seiko. Sho K.K. Large Shapes Mill	Rough	3	659			
	3 rolls					
	Finishing	3	450	Not operating.		
Nihon Kokan K.K. Kawasaki Medium Size Shapes Mill	3 rolls	4	500	1600	100	Yasukawa Tekkojo
Tokyo Kozai K.K. Medium Size Shapes Mill	3 rolls					
	Rough	1	480	1300	100	Fukagawa Tekkojo
	Finishing	1	480	1100	100	,,
Tokai Kogyo K.K. Medium Size Shapes Mill	3 rolls	4	520	1600	97	Yasukawa Tekkojo
Sumitomo Shindo Kokan K.K. Medium Size Shapes Mill	3 rolls	4	550	1800		
Nihon Kokan K.K. Kawasaki: Light Bar Mill	Rough 3 rolls	1	500	1600	120	Yasujikawa Tekkojo
	Finishing 2 rolls	4	300	1000	300	,,
Same Mill	Rough 3 rolls	1	500	1600		,,
	Finishing 2 rolls	4	300	1000	300	,,
Fuji Seiko K.K. Kawasaki Light Bar Mill	Rough 3 rolls	2	520	1600	110	Kubota
	Finishing 3 rolls	5	310	800	275	,,
Osaka Seitetsu K.K. Light Bar Mill	Rough 3 rolls	1	500	1500	94	Japan
	Finishing 2 rolls	4	315	1000	235	,,
Tokyo Kozai K.K. Light Bar Mill	Rough 3 rolls	1	320	1000	200	Fukagawa
	Finishing 3 rolls	1	320	1000	200	,,
		1	320	317	200	,,
		1	320	508	200	,,
Kobe Seikojo K.K. Light Bar Mill	Rough 3 rolls	1	540	1600		Kobe Sei Kojo K.K.
	Finishing 2 rolls	4	315	1000		,,
Wire Mill	Rough 3 rolls	1	480	1320	89	Yasujikawa
	2 rolls	1	475	762	89	,,
	Finishing 2 rolls: Garnett Type	1	260	508	361	,,
		1	280	508	361	,,
		1	297	508	361	,,
		1	322	660	361	,,
		1	327	508	163	,,
		1	340	508	163	,,
		1	340	508	163	,,
		1	260	508	512	,,
		1	280	508	512	,,
		1	297	508	512	,,
		1	312	660	512	,,
Asano Kokura Seikojo, Light Bar Mill	Rough 3 rolls	1	515	1600	100	Yoki-Bukuro Seisaku-Jo

Company and Mill	Type	Stands	Rollers Diameter	Length	r.p.m.	Maker
	Finishing 2 rolls	4	310	1000	300	Yoki-Bukurs Seisaku-Jo
Wire Mill	Rough 3 rolls	1	462	1320	80	Morgan
		1	468	760	80	,,
	Finishing 2 rolls Garnett Type	1	340	508	150	,,
		1	335	508	150	,,
		1	340	508	150	,,
		1	250	508	324	,,
		1	275	508	324	,,
		1	300	508	324	,,
		1	317	508	324	,,
		1	245	508	489	,,
		1	275	508	489	,,
		1	300	508	489	,,
		1	306	660	489	,,
Kamaishi Kozan K.K. Light Bar Mill	Rough 3 rolls	1	470	1525	80	Kamaish
	Finishing 2 rolls	5	305	1000	270	,,
2nd	3 rolls	4	305	1000	250	,,

Nihon Kokan K.K. Kawasaki ; New Mill

This new bar mill installed with machinery from Krupp was ready for operation in April 1931. The details of equipment are not yet published. The diameter of the rolls is, however, said to be 720 inches, and capacity 6,000 tons a month.

No figures showing the rated capacities of these mills are available. The following table prepared by the Yawata Steel Works, shows the rated capacity of each company, for different weights of materials it can roll :—

Company	Material : Heavy Capacity	Rolled	Medium Capacity	Rolled	Light Capacity	Rolled
Mitsubishi Seitetsu : Kenjiho	120,000	—	—	—	—	—
Nihon Seiko Sho ..	—	—	50,000	—	—	—
Kamaishi Kozan ..	—	—	—	—	84,000	28,939
Nihon Kokan.. ..	—	488	83,000	35,651	92,000	30,955
Kawasaki Sharyo ..	—	—	40,000	—	25,000	—
Kobe Seikojo ..	—	—	—	1,038	60,000	26,692
Asano Kokura ..	—	—	—	367	53,000	21,161
Osaka Seitetsu ..	—	—	—	2,659	72,000	17,759
Sumitomo Shindo ..	—	—	40,000	2,137	—	—
Tokyo Kozai	—	268	50,000	4,099	20,000	3,045
Fuji Seiko	—	—	—	—	50,000	15,652
Tokai Kogyo	—	—	54,000	10,745	—	1,875
Total	120,000	756	317,000	56,696	456,000	152,078
Yawata Steel Works..	504,000	183,904	125,000	78,469	180,000	81,247
Grand Total	624,000	184,660	442,000	135,165	626,000	233,325

(In this table "capacity" is that rated on June 30, 1930 : "Rolled," is production the first six months of 1930).

The total rated capacity of the Japanese Bar Mills is therefore 893,000 kilo tons. Production in 1930 of all bar mill products and rails, was 545,874 kilo tons, about 61.1 per cent of capacity.

Of the 12 private companies producing bars, one, the Mitsubishi Seitetsu K.K. in Chosen, has not produced a bar of steel since 1922.

The most important private company is the Nihon Kokan K.K. (Japan Steel Tube Co., Ltd.).

Nihon Kokan K.K.

The Nihon Kokan K.K. (Japan Steel Tube Co., Ltd.) was established in June, 1912. It is capitalized at Y.21,000,000 of which Y.15,225,000 is paid in. It belongs to the so-called Okawa-Tanaka group of companies. For many years, although its production figures have been very large, its finances have been in a bad state, largely because of the huge debt it has been carrying ; this debt the end of 1929 was about Y.15,000,000, in which an issue of 12 per cent preferred shares is not included. This debenture issue of Y.9,000,000 was due for refund in May, 1931, and was successfully reissued, but on rather onerous terms of control.

So far as equipment is concerned the company is in first class condition. It is very ambitious and has just completed a new bar mill installation manufactured by Krupp, put up in its Kawasaki mill. This installation has cost, Y.600,000.

The company's rated capacity of all steel materials is 83,000 tons, medium weight and size shapes, and 92,000 light weight and size materials.

The company produces its own billets, rated capacity Y.188,000 tons a year, largely from scrap iron. Bars rolled from scrap iron were produced in Japan last year at a much lower price than those from billets made from pig-iron. This class of material broke market prices, and caused much confusion and anguish to makers and brokers. Nihon Kokan's bars are almost all re-rolled scrap.

Production of all classes of bars at Nihon Kokan's mills has been steadily increasing since 1923. Figures follow :

Production of Bars at Nihon Kokan's Mills.

1917 ..	11,546 kilo tons	1924 ..	52,654 kilo tons
1918 ..	8,523	1925 ..	64,482
1919 ..	10,969	1926 ..	67,093
1920 ..	14,678	1927 ..	75,384
1921 ..	15,453	1928 ..	85,677
1922 ..	33,074	1929 ..	89,464
1923 ..	29,195		

Kamaishi Kozan K.K.

It has a rated capacity of 84,000 tons of light materials.

Production of bars has been :

1917 ..	11,037 kilo tons	1924 ..	27,885 kilo tons
1918 ..	12,670	1925 ..	30,700
1919 ..	8,455	1926 ..	47,192
1920 ..	4,934	1927 ..	49,991
1921 ..	—	1928 ..	61,387
1922 ..	3,011	1929 ..	71,073
1923 ..	23,142		

Practically all of the capacity for rolling is devoted to producing bars.

Osaka Seitetsu K.K.

(Osaka Steel Works Ltd., or it is probably called at times Osaka Iron Manufacturing Co., Ltd.)

This company was established in December, 1915, with a capital of Y.1,000,000. During the boom years which immediately followed capital was increased to Y.5,400,000. In the course of events capital was cut to Y.530,000 in order to adjust its tangled accounts. After the adjustment was made the capital was raised to its present figure, Y.1,060,000. Because of the drastic adjustments which it courageously carried out the company is notable among steel companies for its sound condition to-day.

This company's rated capacity is 72,000 kilo tons a year of light materials. It is said to be handicapped by a lack of equipment for producing its own billets. It owns 3—25 ton open hearth furnaces.

Recent operations have been strictly limited to the needs of the times. The company lacks capital, and there is some talk of increasing it in order to buy new equipment. It is not owned by any large financial group, nor by any great financier. Its principal shareholders are the large Osaka retail steel merchants.

Production of bars by this company has been :

1917 ..	5,512 kilo tons	1924 ..	18,485 kilo tons
1918 ..	8,030	1925 ..	26,283
1919 ..	7,952	1926 ..	35,991
1920 ..	10,720	1927 ..	38,632
1921 ..	10,145	1928 ..	48,022
1922 ..	12,690	1929 ..	51,128
1923 ..	15,304		

Tokyo Kozai K.K.

The Tokyo Kozai K.K. (Tokyo Steel Materials Co., Ltd.) was organized in April, 1917 ; capital, Y.400,000, all paid-in. Of its 8,000 shares, the Mitsubishi Seitetsu K.K. owns 6,400. The company may well be considered a Mitsubishi subsidiary, but even if it is its finances are in none too splendid a condition. It has loans outstanding of more than Y.2,600,000, which is about seven times its paid-in capital.

It owns 2—10 ton open hearth furnaces ; 1—6 ton and 1—3 ton electric furnace.

This company's rated capacity is 50,000 tons of medium weight materials and 20,000 tons of light weight materials : total 70,000 kilo tons a year. Production has been far below capacity for a long time.

Production of bars has been :

1917 ..	—	1924 ..	11,538
1918 ..	—	1925 ..	8,843
1919 ..	—	1926 ..	10,268
1920 ..	—	1927 ..	13,411
1921 ..	3,829	1928 ..	15,403
1922 ..	7,967	1929 ..	16,976
1923 ..	10,240		

Kawasaki Sharyo K.K.

The Kawasaki Sharyo K.K. (Kawasaki Rolling Stock Co., Ltd.) was established in May, 1928, out of the ruins of the original Kawasaki Dockyard Co. It is capitalized at Y.12,000,000, all paid in.

This company owns 1—25 ton and 2—10 ton open hearth furnaces, and 2—3 ton electric furnaces.

Although it has a rated capacity of 40,000 kilo tons of medium weight materials, and 25,000 tons of light materials ; total 65,000 kilo tons, it has produced no bars since 1927.

Production has been :

1917 ..	11,492 kilo tons	1924 ..	6,863 kilo tons
1918 ..	12,359	1925 ..	13,956
1919 ..	10,310	1926 ..	13,768
1920 ..	11,080	1927 ..	3,361
1921 ..	4,214	1928 ..	—
1922 ..	6,514	1929 ..	—
1923 ..	10,837		

Kobe Seikojo K.K.

(Kobe Steel Works, Ltd.)

The Kobe Steel Works, was established in 1911. Its capital to-day is Y.20,000,000 all paid in. It has been in difficulties ever since the panic of 1927, but recently there have been several changes in management, and its affairs have been in some degree adjusted.

It owns the following open hearth furnaces, with a rated capacity of 110,000 kilo tons a year :

1	40 kilo tons	1	16 kilo tons
1	30	1	12
2	25	1	10

It has a rated capacity of 60,000 kilo tons of light weight materials.

Production of bars has been :

1924 ..	8,242 kilo tons	1927 ..	47,625 kilo tons
1925 ..	29,193	1928 ..	63,902
1926 ..	32,657	1929 ..	72,952

This company is also equipped with 1—6 ton and 1—1.7 ton electric furnace.

Tokai Kogyo K.K.

(Tokai Steel Industry Co., Ltd.)

This company was established during the war in December 1916. The end of the war dealt it the same blow the other Japanese steel companies received. Since the war it has been able to lower its production costs, and to improve its machine equipment.

This company's principal product is medium size sheets, or plates.

Its capital to-day is Y.3,000,000, of which Y.2,250,000 is paid-in. It belongs to the Okawa-Tanaka group of companies, and has outstanding obligations of Y.2,000,000 and more.

This company has no equipment for making its own billets. Plans for installing some such equipment are said to be waiting only a suitable turn of the financial world. Its rated capacity is 54,000 tons of medium size materials.

Production of bars ceased in 1927.

Asano Kokura Seiko Jo K.K.

The Asano Kokura Seiko Jo K.K. (Asano Kokura Steel Works, Ltd.) belongs to the Soichiro Asano group of companies. It was established in December, 1918, and its capital authorized to-day is Y.15,000,000, of which Y.6,299,066 is paid in. Of the 300,000 shares issued, a majority is owned by the Asano Family Holding Company (Asano Dozoku K.K.).

The company owns 3—25 ton open hearth furnaces, with a rated capacity of 56,250 tons a year.

Its rated capacity is 53,000 tons of light weight materials.

Production of bars since 1920 has been as follows :

1920 ..	2,911 kilo tons	1925 ..	21,242 kilo tons
1921 ..	2,368	1926 ..	32,152
1922 ..	7,253	1927 ..	33,803
1923 ..	7,174	1928 ..	44,714
1924 ..	16,804	1929 ..	57,372

Fuji Seiko K.K.

The Fuji Seiko K.K. (Fuji Steel Works, Ltd.) was established in December, 1917. Its capital is Y.3,100,000 all paid-in. Of its 63,000 shares, 10,199 are owned by the Shibusawa group, which probably has control. It is financially supported by the Yasuda group.

It owns four open hearth furnaces of 15 tons capacity each. Rated annual capacity, 45,000 kilo tons.

The rated capacity of the rolling mill is 50,000 kilo tons a year of light weight materials.

Production of bars has been since 1925 only :

1925 ..	8,525 kilo tons	1928 ..	34,041 kilo tons
1926 ..	21,324	1929 ..	37,992
1927 ..	24,652		

Nihon Seiko Sho K.K.

Details concerning this company see given in earlier pages. It owns.

Open Hearth Furnaces :

3	50 kilo tons capacity
4	25
3	10

Rated annual capacity 228,750 kilo tons

Electric furnaces at its Hiroshima Mill :

1	3 tons (kilo) capacity

Crucibles : Muroran Works.

2	2 tons each (kilo tons) capacity.

The rated annual capacity of the rolling mill is 50,000 kilo tons of medium weight materials.

The production of bars ceased, however, in 1927, and before that year it was never greater than 1,500 tons a year.

Sumitomo Shindo Kokan K.K.

The Sumitomo Shindo Kokan K.K. (Sumitomo Copper Rolling & Steel Tube Mill Co., Ltd.) produces both bars and tubes at its Amagasaki Mill. This is one of the direct interests of the important Sumitomo group, organized in July, 1916. Its capital to-day is Y.15,000,000, of which Y.12,000,000 is paid in. It is a very important and sound concern, but considering its connections and soundness it takes little advantage of its opportunities.

It owns 3—25 kilo ton open hearth furnaces with a rated capacity of 56,250 kilo tons a year. Its rolling equipment has a rated annual capacity of 40,000 kilo tons of medium weight materials.

Production of bars since 1921 has been as follows :

1921 ..	7,313 kilo tons	1926 ..	8,094 kilo tons
1922 ..	1,323	1927 ..	10,708
1923 ..	6,442	1928 ..	13,948
1924 ..	266	1929 ..	14,877
1925 ..	—		

Kyushu Seiko Jo K.K.

(Kyushu Steel Works, Ltd.)

This is an old company originally established in 1917. For many years it was closed down, in financial difficulties. But in 1928 it started up again, with a small production of billets and plates.

In 1929 it produced 98,612 kilo tons of open hearth steel, and rolled 1,595 kilo tons of bars : 15.828 kilo tons of "structural shapes," whether I beams, channels, angles, or a mixture of all three, is not stated : 17,352 kilo tons of plates and sheets : and

3,034 kilo tons of rails. This is a total production of 37,809 kilo tons. So the balance of the billets produced was either carried on hand or sold in the market. No details are available.

This company has an authorized capital of Y.10,000,000 of which Y.5,000,000 is paid in. The presence of several Mitsui men on the Board of Directors, would seem to indicate that it is to-day controlled by the Mitsui group.

The companies given before are the Principal makers of bars. Besides them there are a large number of very small makers who produce bars usually from remelted scrap materials. But the total of their production is not at all important, from 1923 to 1929 the whole amount being only 68,350 tons, less than 10,000 tons a year.

The other makers listed on another page are all makers of special steels. These will be considered later.

Imports of Bars

The import of steel bars to Japan is now only about five per cent of the total annual production. Imports in 1930 were:

Round	22,524 kilo tons
Square	2,556
Flat	10,714
Total	35,794

Another series of figures published in the Yawata Steel Works, *Hanbai Junpo*, makes this total for 1930, 37,097 kilo tons. This figure includes all miscellaneous shapes, etc., so it is probably more correct than the one given above.

In 1929, bar imports were 93,663 kilo tons, 15.7 per cent of the total domestic production. In 1928 they were 68,851 kilo tons, about 17.9 per cent of the total produced in Japan.

In the matter of import figures there are such differences between even the figures published by the Yawata Steel Works at different times, that in order to avoid all confusion in dealing with them, those used here are as given in earlier pages. But for reference the imports of bars by countries are given here, for 1929 and 1928 and 1927. The figures for 1930, are still not known.

Country of Origin	*1929*	*1928* *Kilo Tons*	*1927*
England	7,026	5,211	9,795
France	11,828	5,478	1,082
Germany	42,796	23,010	43,789
Belgium	16,140	10,843	21,055
Austria	3,562	2,291	2,515
Holland	1,421	1,028	1,940
Sweden	1,506	1,543	1,930
United States	2,111	907	1,193
Kwantung Province	21	496	23
Others	220	305	37
Total	85,631	62,546	83,359

The following table showing the amounts of bars used in the different industries in 1928, is given here for what it may be worth. It is taken from *Seitetsu Gyo Sanko Shiryo*, of June 30, 1930.

Bars : *Industry*	*Kilo Tons* *Round*	*Square*	*Flat*	*Miscellaneous*	*Total*
Railways : including electric ..	12,341	7,578	5,407	6,998	32,324
Building construction, and concrete reinforcing	234,603	9,872	19,460	1,478	265,413
Shipbuilding	16,088	3,017	6,265	2,180	27,550
Machinery making	47,333	13,535	26,858	59,261	146,987
Petroleum : Gas : and Waterworks :	3,905	96	556	10	4,567
Mining	8,604	2,682	3,563	50	14,899
Miscellaneous Industries ..	33,790	7,116	19,155	4,983	65,044
Total	356,664	43,896	81,264	74,960	556,784
Same figures for 1927 consumption :					
Railways..	9,794	4,102	4,990	166	19,052
Building Construction ..	127,892	9,326	20,562	944	158,724
Shipbuilding	10,327	1,505	9,574	4,828	26,334
Machinery	36,582	12,394	27,758	927	77,661
Petroleum: Gas: and Waterworks	1,482	100	377	9	1,968
Mining	7,198	2,061	5,228	315	14,802
Miscellaneous	24,111	4,212	10,711	571	39,605
Total	217,386	33,700	79,200	7,760	338,046

(To be Continued)

New Railway in Chekiang

Completion of the Hangchow-Chuki division of the Hangchow-Kiangshan Railway marks a new era in the history of transportation in Chekiang Province, says the Chinese *Economic Bulletin* for it is the first railway penetrating the central and western sections. For hundreds of years people have been forced to travel by slow, clumsy, and uncomfortable sailing-vessels, or more recently in old-fashioned, always crowded, and very insanitary, river steamboats.

The construction of the line was proposed about two years ago by Mr. Chang Ching-kiang, ex-Chairman of the Chekiang Provincial Government, and work was actually begun in March, 1930. In order to keep down the cost it was decided to build a light railway, and the expense, to be borne entirely by the Provincial Government in monthly installments, was estimated at $6,000,000. On several occasions, however, work would have been suspended on account of financial difficulties but for able management, and early in June the Hangchow-Chuki section of the line, 65 miles in length, was completed, being opened to traffic in July. It is expected that trains will go as far as Lanchi, a business center 99 li from Kinhwa.

To avoid unncessary expenditure, the organization of the railway staff has been made as simple as possible. The director of the railway is also head of the engineering department, while the vice-director is also head of the transportation department, which consists of two sections—traffic and mechanical.

Arrangements were made to draw $400,000 every month from the provincial treasury for 15 consecutive months from March, 1930, making a total of $6,000,000 for construction expenses. Owing to financial difficulties, however, the provincial government was unable to make regular advances, and consequently the work of construction was greatly delayed.

In regard to the general plan of construction, it is intended at first to build one siding at every station. In bridgework the understructures generally consist of wooden piles, although masonry and concrete are occasionally used. The superstructures are either Oregon pine logs or 18-ft. steel girders taken from the Shanghai-Hangchow-Ningpo Line. These girders rest upon 12-in. square timber piles driven in rows of five. At some crossings small span concrete arches are constructed. The bridge across the Tsim Shan Kiang, is the only one in which structural steel is extensively used. There are six girder spans of 42-ft. each in the center of this bridge, and each pier consists of two rows of Oregon pine piles, 70-ft. in length, and seven in each row.

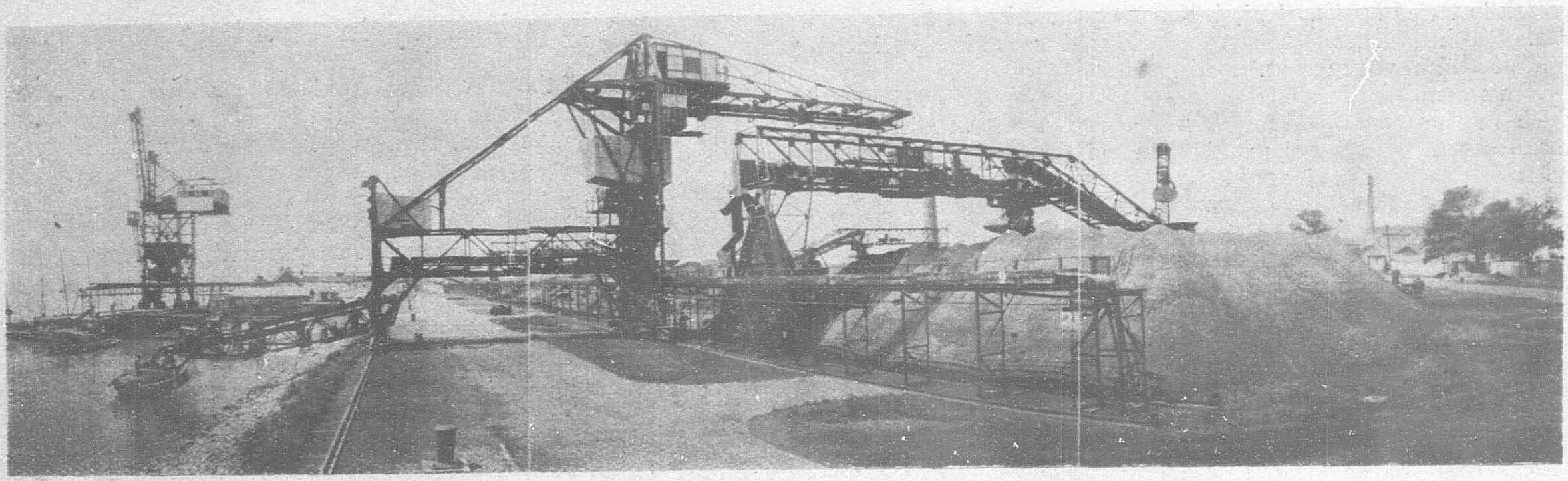
For the construction of platforms and sidings at stations rock excavation near Lanchi, track extension along the Tsien Tang River, a retaining-wall at Kinhwa, and the protection of embankments will be carried out later.

The railway owns three 2-6-0 type locomotives, six passenger-cars, two luggage-vans, eight open-cars, and two cattle trucks. The carriage-work is of Chinese make, the steel frames being American. Before the end of this year it is expected that six more locomotives, 24 frames of passenger-cars, 10 frames for luggage-vans, eight open-cars, and two cattle-trucks will be ready for use. According to the latest report by the Department of Reconstruction of the Chekiang Provincial Government, three additional locomotives and 20 passenger-cars will be shortly ordered from abroad.

Fares are fixed at 1½ cents per mile per passenger. The revenue of the Hangchow-Chuki section of the line is $500 a day, barely enough to cover construction costs of the remaining section of the railway. By the time the Chuki-Lanchi division is completed, however, it is hoped the revenue will increase to three times the present amount.

The railway authorities are planning a through traffic service in connection with the Shanghai-Hangchow-Ningpo Line. If this is done, the Hangchow station would have to be removed from Si-sheng to a point along the eastern bank of the Tsien Tang opposite Zakow, the terminus of the Shanghai-Hangchow-Ningpo Line, and four or five steam-ferries would be necessary to carry passengers and freight across the river.

For financial reasons, the Chekiang Provincial Government is inclined to make Kinhwa the terminus of the railway, building a modern road from that point to Kiangshan, on which highway passengers and freight could be carried by motor vehicles.



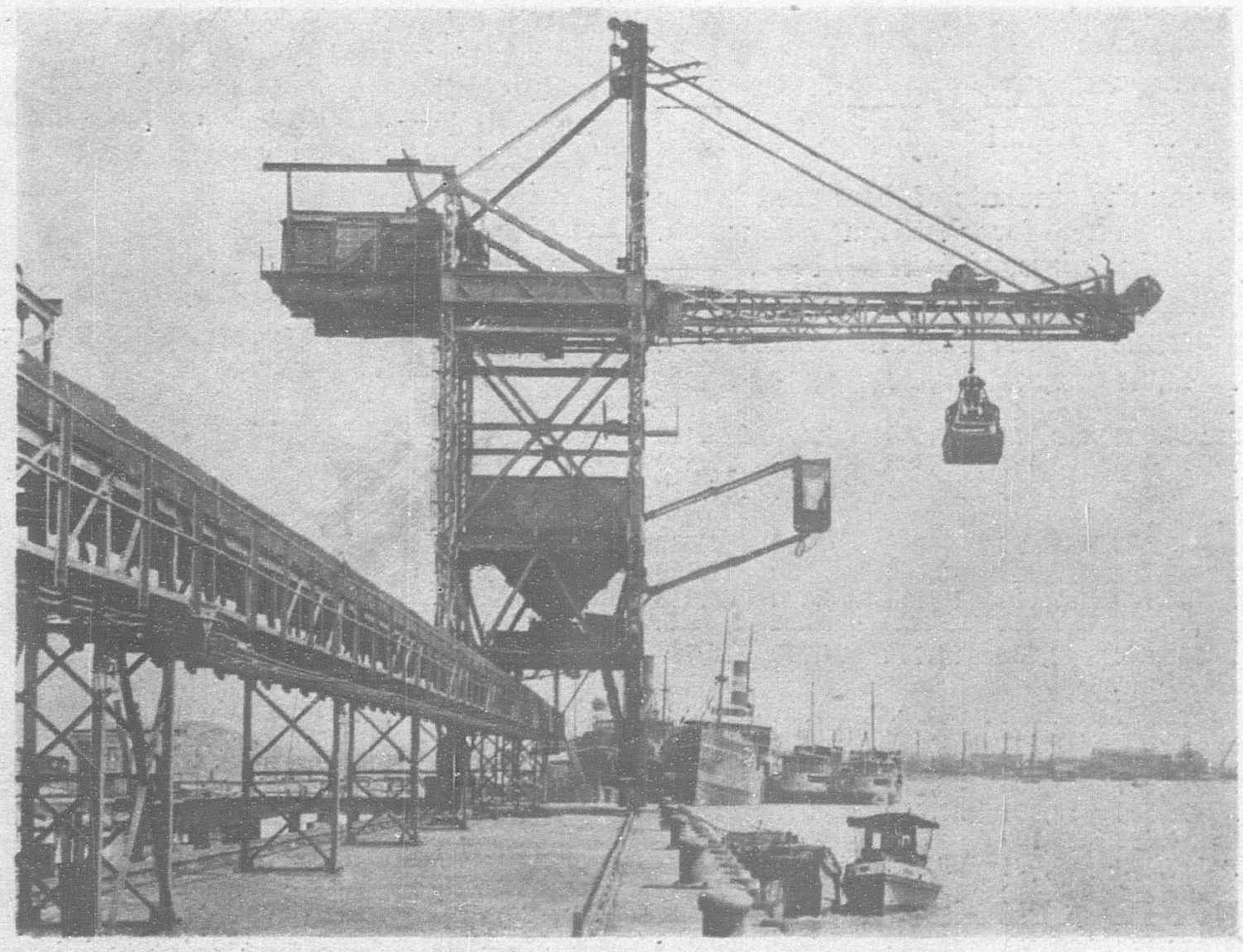
From left to right—Unloading Grab and Conveyor and two Stacking Conveyors

The Shanghai Coal Handling Plant of the Kailan Mining Administration

One of the most notable examples of engineering work completed in recent times in China is the new coal handling plant which was built for Messrs. The Kailan Mining Administration under direction of the firm of Messrs. Palmer and Turner at Lung Hua on the Whangpoo River about four miles from the center of Shanghai. The site is triangular in shape with a frontage of about 1,000 feet along the Whangpoo. A small creek called Zah Whei Kong divides into two branches at the north-west corner of the site and forms two natural boundaries of the depôt. The site therefore actually is an island, the only connection with the mainland being a reinforced concrete bridge leading to the main gate.

The work of reclamation here was begun in the year 1926 and actual construction work was begun at the end of 1928, reaching completion in July, 1930. Originally it was planned to have the coal unloaded from a reinforced concrete wharf along the Whangpoo river and issued to lighters lying in the small creek along the western boundary of the site. The S.-H.-N. Railway, however, claimed that this creek was their private property and opposed the proposal of the Kailan Mining Administration to use it for issuing purposes. In order to obviate any possible future trouble it was finally decided to transfer the issuing equipment to the Whangpoo River front. The revision in the design and later the delay in shipment of mechanical plant caused the construction period to be prolonged to one year and a half.

The various mechanical equipments were designed by the Consulting Engineer, Mr. F. G. Mitchell of Messrs. Mitchell Conveyor and Transporter Co., Ltd., of England, and ordered by The Chinese Engineering & Mining Co. All the units are designed to be of adequate strength to resist wind pressure of 56 lbs. per sq. ft. and to work in a wind pressure of 10 lbs. per sq. ft.



The Main Unloader which Handles 400 tons an hour

The total quantity of coal which it is estimated to pass through the depôt yearly is 550,000 tons of which 50,000 tons are issued directly from the wharf to native boats, 50,000 tons are loaded to the motor trucks and the balance issued to native lighters.

General Description of Plant

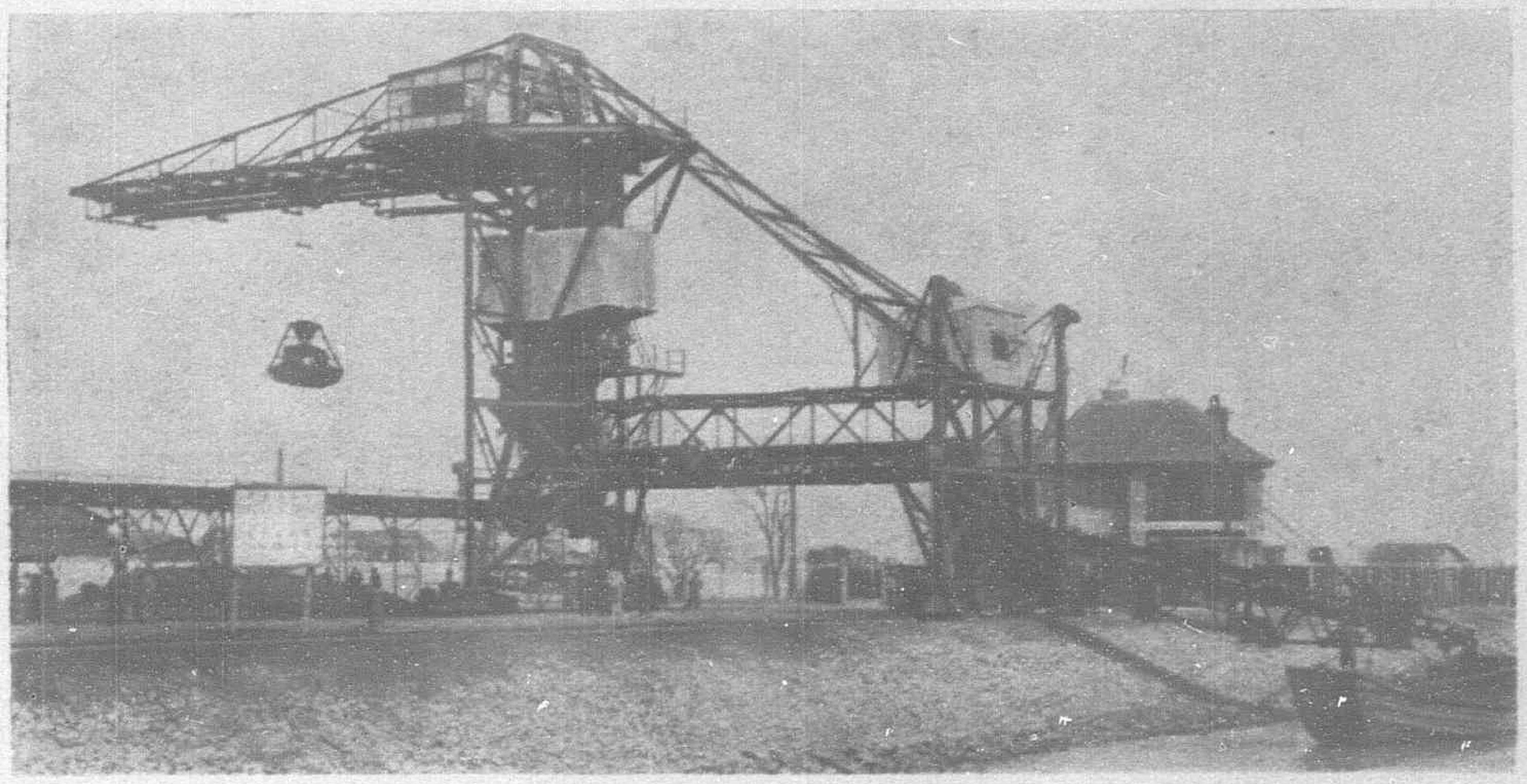
In general the plant consists of an unloading wharf for coal arriving at the depôt, a screening plant, a stone for screened and unscreened coal, and finally arrangements for issuing the coal to lighters or trucks.

Unloader.—The unloader can be moved along the Wharf on rails. The hoisting, grabbing and traversing motions are connected together by compensating gearing so that the various motions can be combined at will. The operator is housed in a small cabin which can be adjusted to the most suitable position for observation. The horizontal boom can be raised if necessary to a nearly vertical position in order to clear the masts of ships.

Screening Plant.—The screening plant consists of three Marcus Screens 57-ft. 6-in. by 4-ft. 0-in. wide. These screens are oscillated horizontally. The coal is deposited at one end and is slowly worked to the other end. The slack is collected under the screen by a belt conveyor. The lump after reaching the end is also collected by a belt conveyor which carries it to the store.

Store Bridges.—The store is spanned by three 140 span bridges. These bridges which move along the store on 75 lbs. standard rails, carry anti-breakage distributors which in addition to being swung in a horizontal plane can be moved vertically in order to minimize the fall and prevent undue breakage of coal.

Issuing Tower.—The issuing tower consists of a portal frame-work spanning a roadway between the rail tracks on which the tower moves. By means of this tower the coal is hoisted to a height of forty feet and delivered either to trucks or lighters lying along the river front.



The Distributor to Boats

Conveying and Storage of Coal

The steamship carrying coal from Chingwantao is first anchored alongside a deep water concrete wharf. An unloader grabs the coal from the ship's hold at the rate of about 300 tons per hour and dumps it into a steel hopper, which in turn feeds the belt conveyor. The conveyor carries the coal directly to the screening plant which separates the coal into slack and lump, slack being coal under $\frac{3}{4}$-in. and lump over $\frac{3}{4}$-in. size. The coal can also be issued if desired to the customers' lighters alongside the concrete wharf without passing through the screens. The coal as it comes from the mine contains a very small percentage of shale. The shale is picked out by laborers in the screening plant and passed out by the shale belt for disposal.

After the coal is screened two low level belt conveyors carry lump and slack respectively to the tripper which trips it to any of the three 140-ft. span store bridges. The coal is then lowered for storage through anti-breakage distributors. If desired the coal as it comes in from the wharf can be bye-passed at the screening plant and carried away by the low-level belts, trippers, conveyor bridge and stored without being screened.

Issuing of Coal from Store

The processes of issuing coal from store can be briefly summarized as follows:—

(1) Issuing of screened coal to lighters lying along the river frontage through the issuing tower.

(2) Issuing of screened coal to baskets through the issuing tower and carrying away by trucks.

(3) Issuing of unscreened coal by the caterpillar crane to the high level belt and thence to the screening plant.

(4) Issuing of unscreened coal by the caterpillar crane to the high level belt, bye-passing at the screening plant and issuing to the lighters at the fixed tower.

(5) Issuing of screened coal by the caterpillar crane to the 140-ft. span bridge passing through the issuing tower and to the baskets or lighters.

Numerous automatic weighers are provided at various points to weigh coal stored and issued.

Power Plant and Electrical Equipment

The entire power plant equipment for this coal handling plant supplied by the General Electric Company of England was installed under the supervision of Mr. J. E. McLeman, then acting for the General Electric Co. of China, Ltd., at present in charge of the Lamps and Wiring Devices Section of Andersen, Meyer & Co., Ltd.

Power Plant.—Electric power is obtained from 2—750-h.p. "Allen" high-speed vertical compound reciprocating steam engines, each equipped with heavy flywheel and arranged for direct coupling to 2—500 kw. 440-volt D.C. G.E.C. compound wound generators. Generators are fitted with equalizers for parallel running. Transmission is through underground cables from the main switchboard located in the power house, to a substation located underneath the screening plant. From this substation, feeders go out to the unloader, issuing tower, travelling bridges, screening plant, belt conveyors and other equipment.

Electrical Equipment.—In all, 52 motors were supplied manufactured by the G.E. Co. of England, ranging from 130-h.p. down to 3-h.p. most of which are series wound to provide for reverse operation. Operation of the unloader, issuing tower and travelling bridges is provided through drum controllers through automatic contactor panels located in cabins conveniently placed on this main equipment.

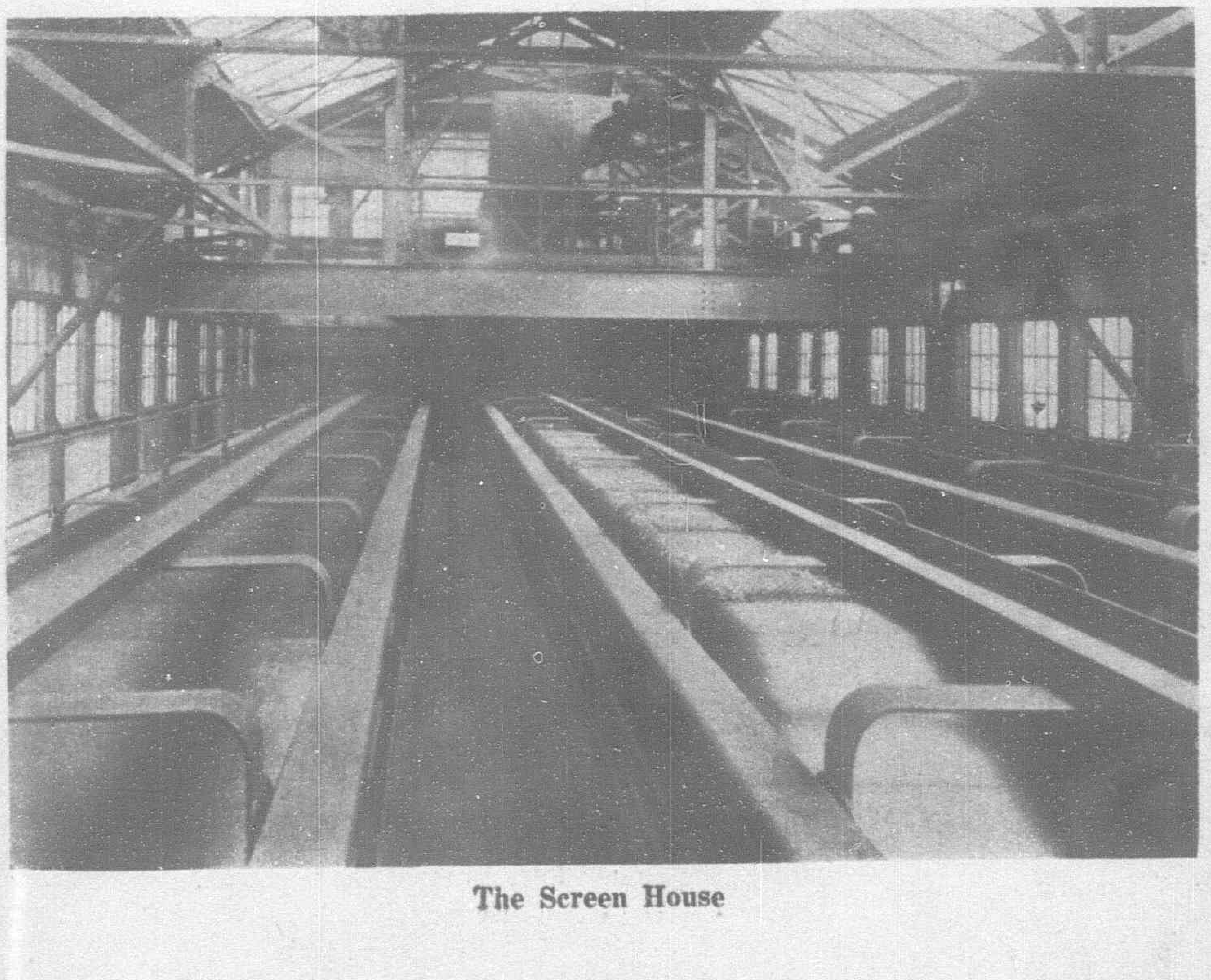
For operation of the unloader, 3—130-h.p. motors are provided, 1—60-h.p. motor for travelling the unloader itself, 1—30-h.p. motor for luffing the unloader tower extension, and 1—15-h.p. motor for luffing the control cabin.

Over eight tons of resistance grids are mounted on the unloader to provide for complete operation.

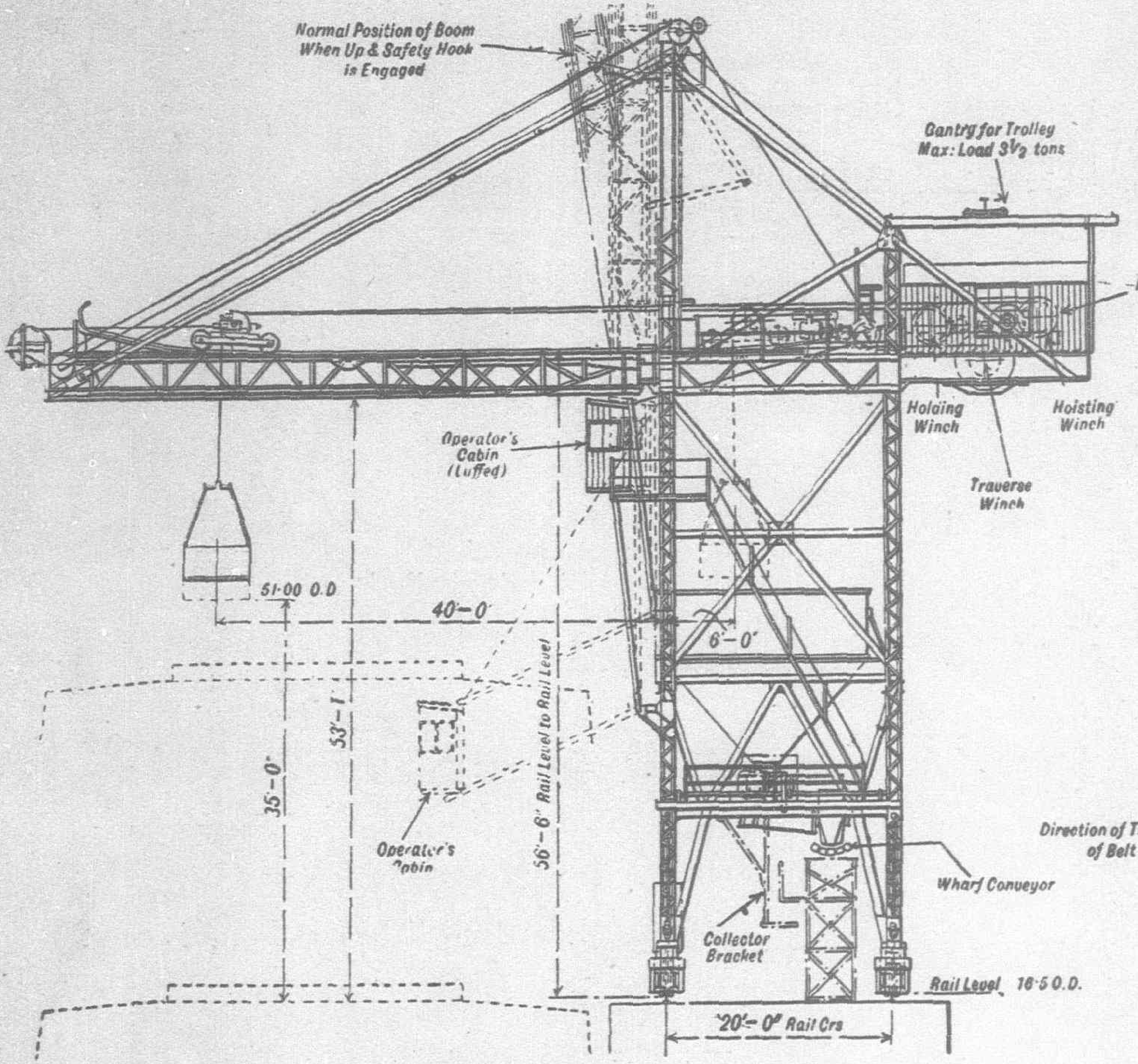
The issuing tower is practically the same as the unloader but on a smaller scale and with no tower extention. 2—50-h.p. motors are provided there for operation of the grab and hoist with a 30-h.p. motor for travelling the issuing tower itself. Control is also provided through automatic contactor panels governed by drum controllers.

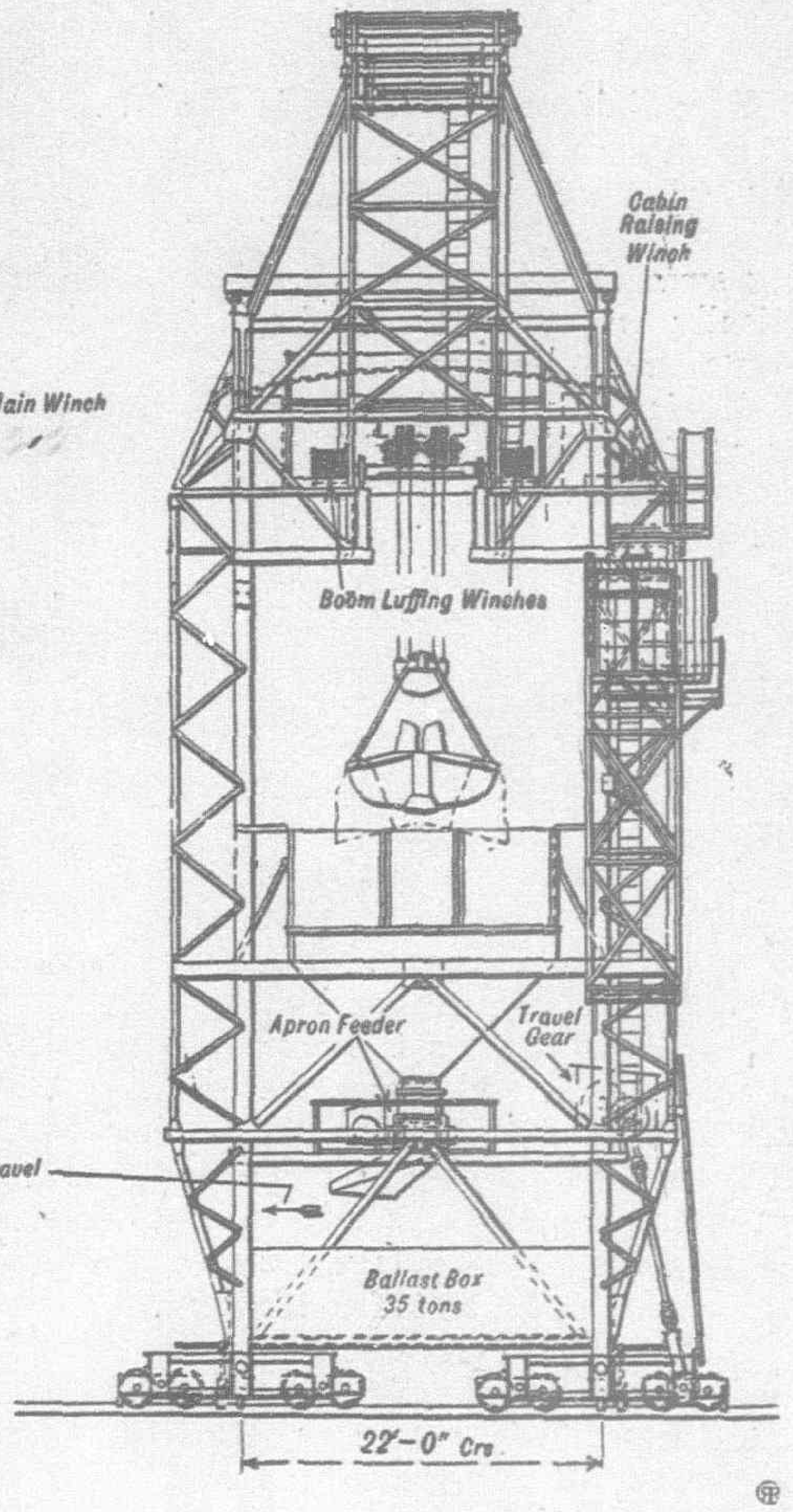
For the three travelling bridges, control is provided in the same way as for the unloader and issuing tower. Contactor panels and drum controllers control operations but on a smaller scale.

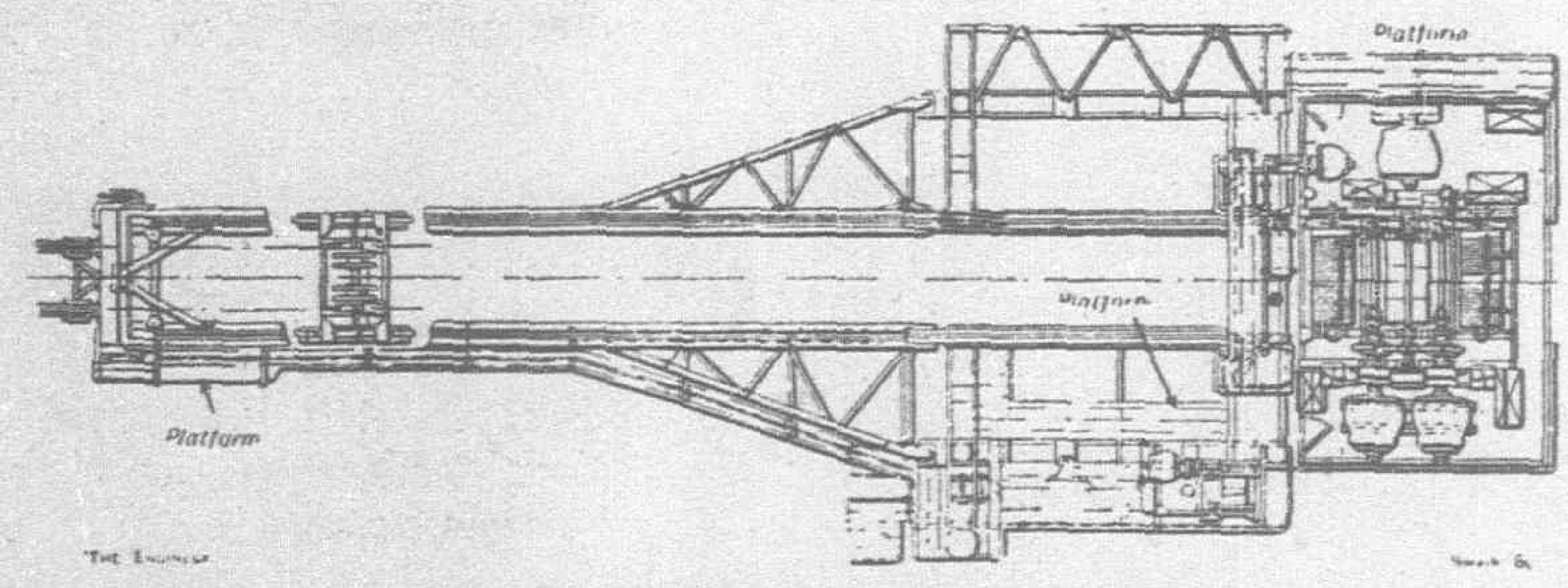
In order to provide for easy stopping of the plant, push buttons are located at intervals along all the conveyor lines. These are interlocked



The Screen House







GENERAL ARRANGEMENT OF UNLOADING TRANSPORTER

so that if the whole plant were running, by pressing the push button on the last conveyor, this would automatically stop all other conveyors, in this way, that No. 2 would stop No. 1, No. 3 would stop Nos. 2 and 1, and No. 4 would stop Nos. 3, 2 and 1, and so on.

Especially flexible cab-tyre cables were employed in the overhead transmission lines for main operation and control. Altogether approximately 20 miles of cable were used which were supplied by Pirrelli, Ltd., Southampton, England, which is an affiliated company of the G.E. Co.

For the lighting system, 2—30-kw. Allen vertical compound reciprocating steam engines are coupled direct to G.E. Co. of England generators for general illumination of the plant and also to provide light for night-work. Floodlighting projectors are located on the unloader, issuing tower and travelling bridges in such a way as to disburse an even volume of light for the whole plant to facilitate night operation of same.

Steam Power Plant

The three boilers supplying steam for the above mentioned generators have the following particulars :—

(*a*) Two Galloway boilers of about 100 square meters of heating surface each, fitted with a 40 square meters superheater able to be used either for the two boilers working together or for each of them separately.

(*b*) One Galloway boiler of 120 sq. meters heating surface with superheater of 40 square meters surface.

These boilers will produce steam at 10 kilos per sq. centimeter superheated to about 220 to 240 degrees centigrade.

Water Supply System

The question of water supply was given considerable thought and discussion. It was first suggested to use artesian well water for boiler feed, steam condensing and domestic purposes. After the contract to install the electric generating sets was let, the volume of water required for condensing purpose only was found to be from 1,050 to 2,100 gallons per minute and to cope with this demand alone it would require at least three six inch artesian wells.

As the engineers of Messrs. Kailan Mining Administration had a strong preference for river water for boiler feed, the idea of artesian well supply was discarded.

The water supply system as it is installed consists of the following arrangements :—

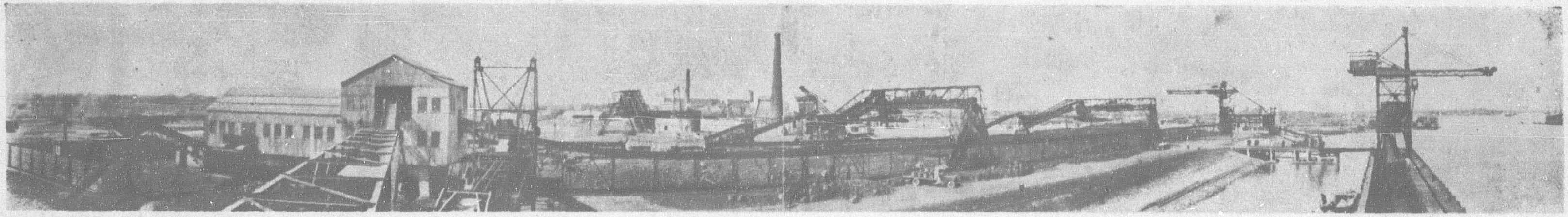
(1) A pump house on pile foundations is located on the Whangpoo River front. Two electrically driven Allen pumps of 915 gallons each per minute capacity and two pumps of 135 gallons each per minute capacity pump the river water into a 12-in. dia. water main by which it is conducted to the ejector condensors. After passing through the condensors the water is discharged into a sump from which a 24 dia. concrete pipe discharges to the creek.

(2) From the sump there is a four inch pipe through which boiler feed and domestic supply water is pumped to the oil eliminator and filters. The capacity of the circuit is 3,000 gallons per hour, under a pressure of 40 lbs. per sq. in. Two 35,000 gallons elevated tanks are provided for the storage of this water.

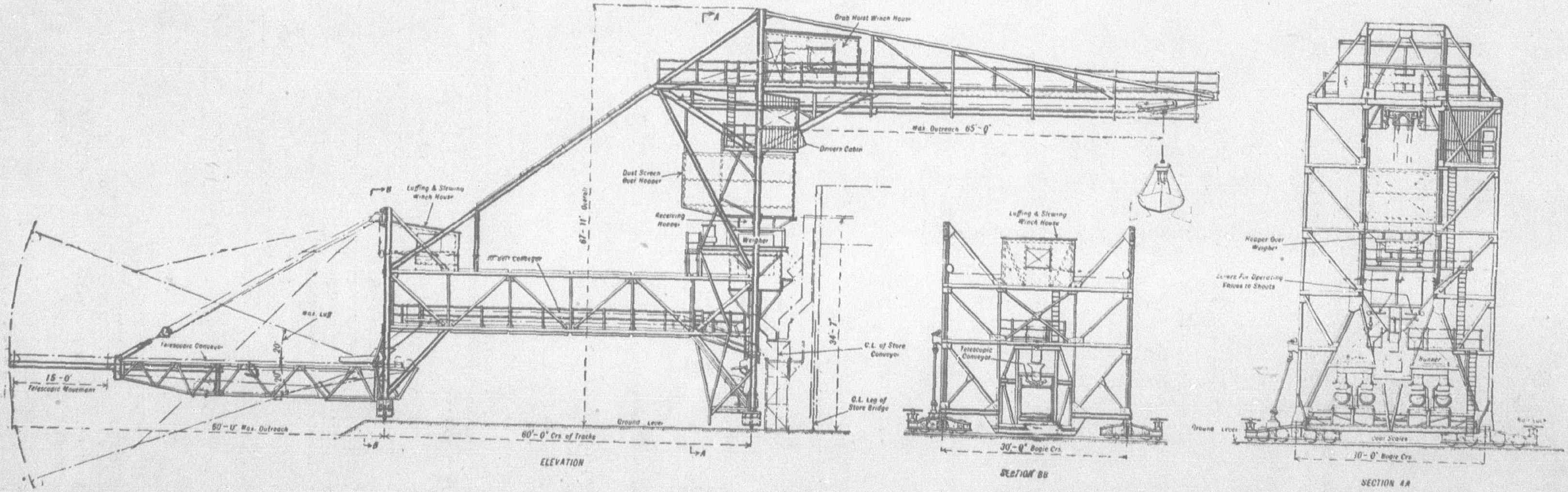
(3) A small tank of 600 gallons capacity at a height of 50-ft above ground level is provided for domestic supply, the water being pumped to this level from the 35,000 gallon tanks.

(4) The boiler feed is drawn under gravity from the 35,000 gallon reserve tanks, to a small underground tank from which the boiler feed pumps are supplied.

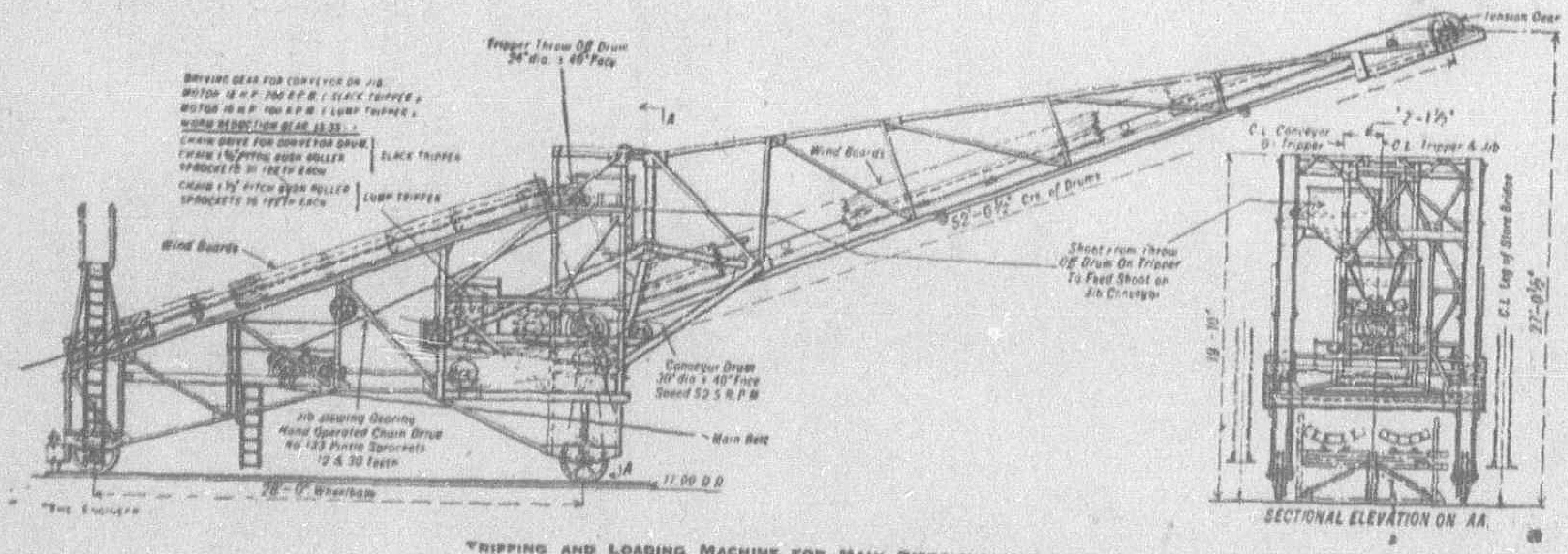
GENERAL VIEW OF THE COAL HANDLING PLANT



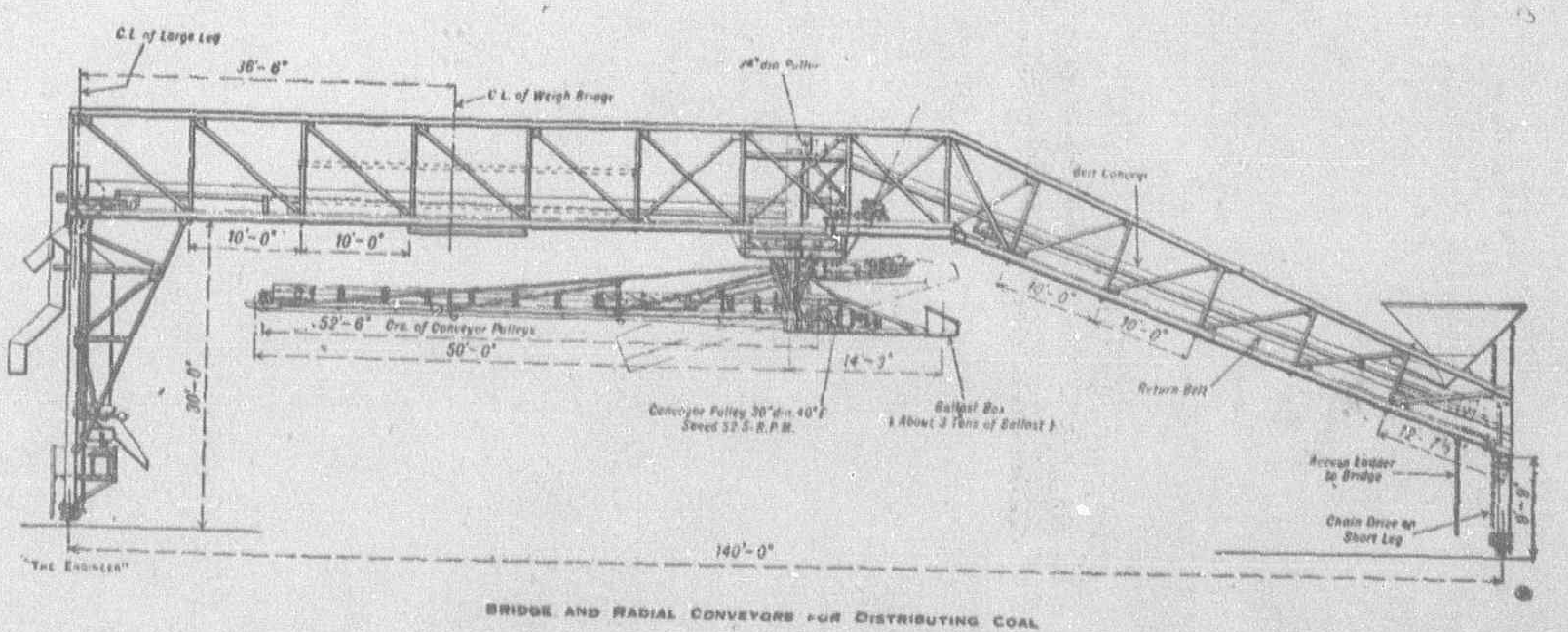
#1



General Arrangement of Reclaiming Grab and Telescopic Issuing Conveyor

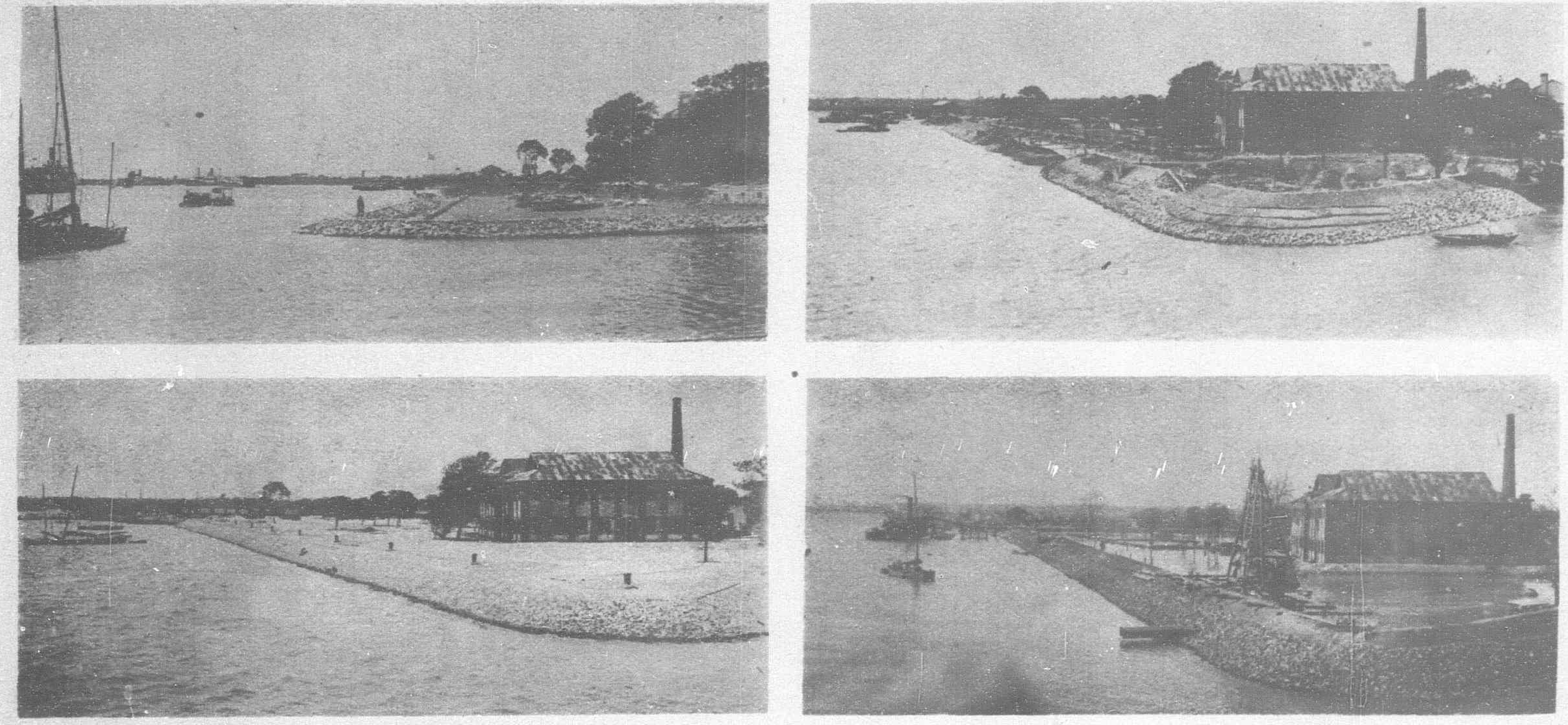

Tripper Throw Off Drum 24" dia. x 40" Face
Tension Gear
Wind Boards
52'-0½" Crs. of Drums
Shoot from Throw Off Drum On Tripper To Feed Shoot on Jib Conveyor
Conveyor Drum 30" dia x 40" Face Speed 52.5 R.P.M.
Jib Slewing Gearing Hand Operated Chain Drive
Main Belt
Slack Tripper
Lump Tripper
11.00 O.D.
18'-0" Wheelbase
"The Engineer"
C.L. Conveyor Or Tripper
C.L. Tripper & Jib
7'-1½"
19'-10"
C.L. Leg of Store Bridge
27'-0½"
SECTIONAL ELEVATION ON AA.

Tripping and Loading Machine for Main Distributing Belt



Bridge and Radial Conveyors for Distributing Coal

2



Views of the Site at Lung Hua showing Bunding before work was started on the Coal Handling Plant

Reinforced Concrete Wharf

The wharf is of reinforced concrete construction resting on 75-ft. timber pile groups. It is tangent to the river normal line and is divided into main and extension wharves. The main wharf is 300-ft. long and 30-ft. wide. Two lines of 100 lbs. rails at 20-ft. c.c. enables the unloader to travel almost the full length of the main wharf. The extension is 26-ft. wide and 175-ft. long. With partly timber and partly r.c. decking. The design data for the wharf is as follows :—

Number of piles used—535 piles

Size of piles—75-ft. long, minimum butt diameter 15 inches.

Frictional resistance of buried surface of piles 270 lbs. per sq. ft.

Buried length of piles allowed 40-ft.

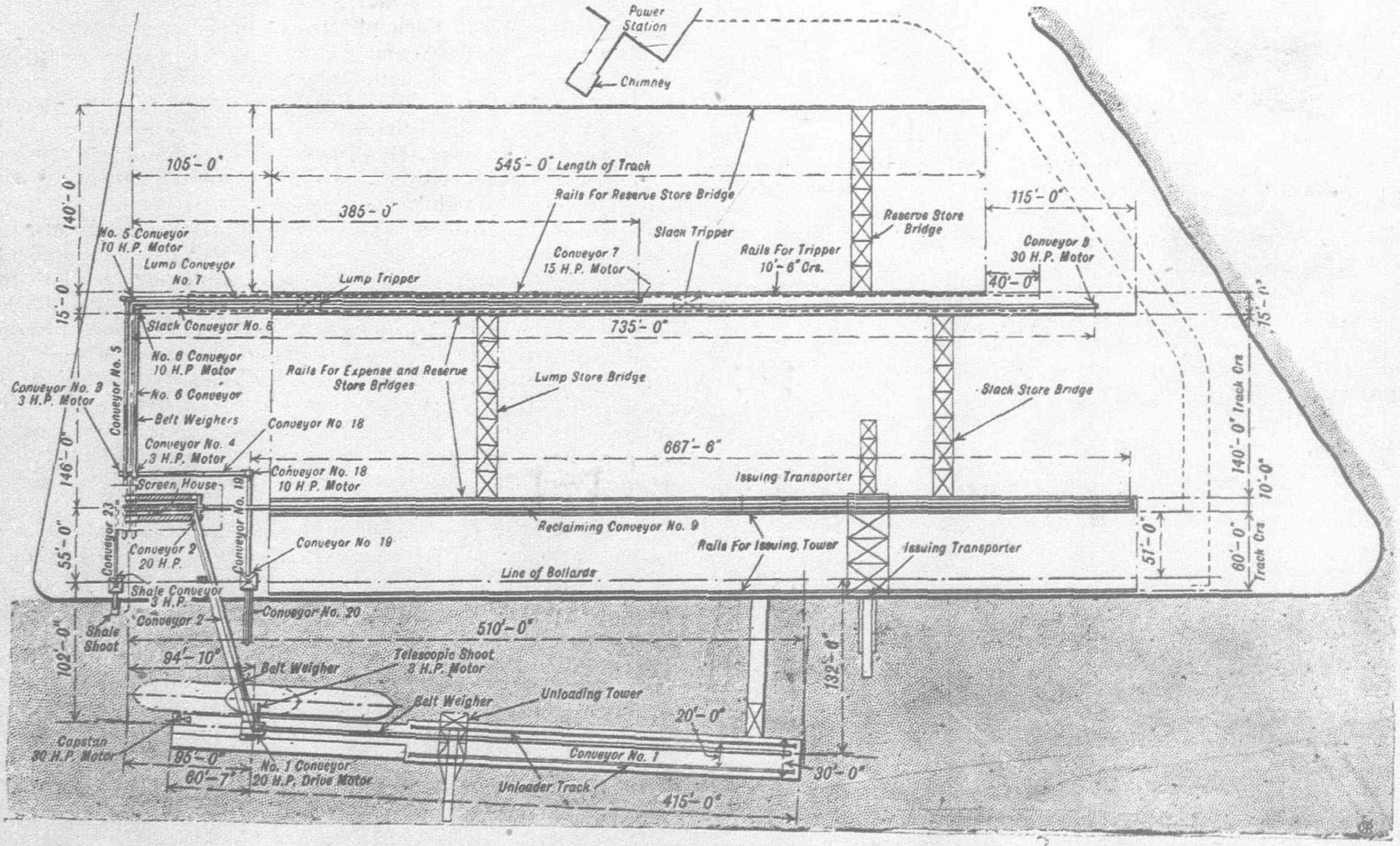
Allowable bearing value of one pile, 30,600 lbs.

Allowance for impact 20 per cent.

Allowance for possible scour 29,800 lbs. per group of seven piles.

Live load allowance 350 lbs. per sq. ft. in addition to the conveyor column loads and moving wheel loads the unloader.

Level of top of pile 6.00 W.H.Z.



Key Plan of Coal Handling Plant and Storage Ground

Dolphins

The design of the two dolphins, one at each end of the wharf required lengthy discussion and consultations with many experts.

It was finally agreed that a maximum horizontal pull of 25 tons should be used in the design of the dolphin. The bollard on the dolphin is about 40-ft. above the mud line and is bolted to a massive concrete block of 123 tons supported on 17-75-ft. Douglas fir piles with 11-in. dia. tips and 18-in. dia. butts.

Land Foundations

The original ground level over the greater portion of the site was at 14-ft. above Woosung horizontal zero. 3-ft. of hydraulic fill was deposited in 1927 by the Whangpoo Conservancy Board. The soil was found to contain a high percentage of water which could not be drained away except by the application of high pressure. Where it was required to support a foundation directly on the ground the following method was adopted.

The excavation was made and left for two weeks in the sun to dry out the water. This left a fairly hard surface on which the foundation was built. The following design data was adopted for this area.

The gross soil pressure at a depth of 3-ft. due to the imposed load together with the weight of foundations and back filling is 1,400 lbs. sq. ft. The nett soil pressure due to imposed load alone =1,000 lbs/sq. ft.

The area next to the river consists of fill which had been laid on the river bed by the Whangpoo Conservancy Board to a depth of 12-ft. Since no load could be safely imposed directly on the ground the rail foundations on this part of the site were carried on 28-ft. arch piles assuming skin friction to be 224 lbs. per sq. ft. and the safe load on each pile about 5.0 tons.

In view of the possible slight movement of the ground next to the river, the rail foundations for the issuing tower were connected together by reinforced concrete ties in order to maintain the correct gauge.

Special precautions were taken in the case of the screen foundations. These were located directly over the site of an old shallow pond. Provision had to be made for the vibration due to heavy flywheels and the screens. This was done by connecting all foundations in both direction by reinforced concrete ties. A reduced bearing value of the ground was taken for these foundations of 600 lbs. per sq. ft. nett.

Details of Equipment

In broad outline, the plant may be divided up into several distinct sections, There is the grab on the wharf for unloading the colliers and putting the coal on to a conveyor system, which takes it to a screening plant. There is a system of conveyors which reach from the screening plant over the whole of the site, and are supplemented by transverse travelling conveyors for the even distribution of the coal. Finally, there are two means of re-issuing the coal. A grab transporter, which commands the main storage ground, and a caterpillar grab, to go round the outside storage space and send back coal to the issuing transporter by way of the conveyor belts.

The jetty, as will be seen from the key plan, stands well in front of the bund, so that there is ample room behind for the accommodation of lighters and junks taking away small consignments of coal. On this jetty there works the unloading transporter, of which we give a drawing herewith. It has an outreach of 40-ft. and can, consequently, easily command the largest collier likely to come alongside. It straddles a pair of rails of 20-ft, gauge, between which there is a long belt conveyor (No. 1 on the plan) for taking away the coal brought out of the colliers.

This machine, which is equipped with a Barnard grab, with a capacity of about 72 cwt. of coal, has a luffing jib, so that it may be brought clear of the rigging of a ship while it is moved from hatch to hatch. The time required for luffing up the jib is only 1½ minutes, and the operation requires a motor of 30 horse-power. The cabin from which the crane man controls the machine also has a luffing action, as indicated in our drawing, to enable it to be brought into a convenient position so that he can manipulate the grab without the assistance of a signaller.

The winches are all arranged on a cantilever structure at the rear of the tower and, consequently, counterbalance the weight of the jib. There are two motors of 130 horse-power each running at from 450 to 675 revolutions per minute for the grab, another of 130 horse-power for traversing, one of 60 horse-power for travelling, arranged just above the portal, a 30 horse-power main luffing motor, a 15 horse-power motor for luffing the cabin, and a three horse-power for feeding the coal from the hopper onto thec conveyor. All these motors were made by the General Electric Company.

The speeds of operation are: Hoisting, 465-ft. per minute; lowering the grab empty, 700-ft. per minute; traversing, 585-ft. per minute, and travelling, 100-ft. per minute.

The coal grabbed out of the ship is dumped into a hopper in the tower of the unloading machine, and is fed by an apron plate feeder on to a belt conveyor, which runs along the length of the wharf. This conveyor has a capacity of 300 tons an hour, and passes over a weighing machine, so that the amount of coal discharged may be recorded. At the end of the wharf the conveyor rises to command another transverse conveyor, which goes ashore over a bridge. The coal is transferred from one conveyor to the other by a chute, which has an alternative opening, so that the coal may be delivered directly into a lighter lying alongside. The wharf conveyor is 415-ft. long and is driven by a 20 horse-power motor, while the bridge conveyor is 165-ft. long and also has a 20 horse-power motor.

The bridge conveyor delivers the coal to a screening house, where the screening is done on three parallel conveyors, each capable of dealing with 100 tons an hour. They are 42-ft. 6-in. long by 4-ft. wide and perforated with ⅞-in. holes to give an undersize of ¾-in., or less, and lump coal above that size. Picking troughs are arranged down the center of each screen to permit the coal to be cleaned by hand. The shale and other dross picked out is collected at the end of the screens and carried away by a 20 inch conveyor marked No. 23 in the plan, to a small elevated hopper near the waterside. The shale can be dumped from this hopper either into lighters on the river or on to a heap on the ground, whence it can be carted away. The screens are each provided with a door in the upper or screening tray, so that, if desired, the whole of the coal can be passed through the house without screening, the screens then merely acting as conveyors.

In ordinary running the lump and the small coal are delivered separately on to two short collector belts, which deliver on to two conveyors, marked No. 5 and No. 6, which run across the end of the storage ground. Each of these conveyors is equipped with a weighing machine, to enable the proportion of large to small coal being stored to be determined.

It may occasionally be desired to issue graded coal to lighters as the collier is being discharged. A second by-pass in the system is, therefore, provided immediately after the screening house, in the form of the conveyors Nos. 18, 19 and 20, which are 30-in. wide. There is a weighing machine on the first of these conveyors, and the loading conveyor is mounted on a tower in such a manner that it can be luffed and has a telescopic end, so that coal can be loaded at any state of the tide with a minimum of breakage.

For storage purposes the ground is divided into two sections, as shown in the plan, between which there run two long conveyors—one is 735-ft. long and the other 385-ft. One is devoted to the conveyance of lump coal, and the other to slack. These two conveyors—Nos. 7 and 8—have 30 h.p. and 15 h.p. motors respectively. On the river side of these conveyors, there is an area capable of accommodating 32,500 tons of coal, which is considered as the general working stock, while behind the conveyors a reserve of 26,500 tons can be stacked.

The coal, naturally, has to be stacked to a considerable height, but, on account of the length of the conveyors, they could not be conveniently raised sufficiently to command the heap. Instead, they are kept at a low level and the coal is taken off and raised to the requisite height by separate machines and then distributed over the storage ground by three travelling bridge conveyors.

The broad principle of the process of distribution is to pass the long main belt over a tripper—there are two trippers, one for each belt—to pick up the coal from the tripper on a short inclined conveyor and dump it into a hopper at the end of the travelling bridge. It is then taken across the bridge and spread on the dump by a radial arm.

(Continued on page 29)

Electric Power In Formosa

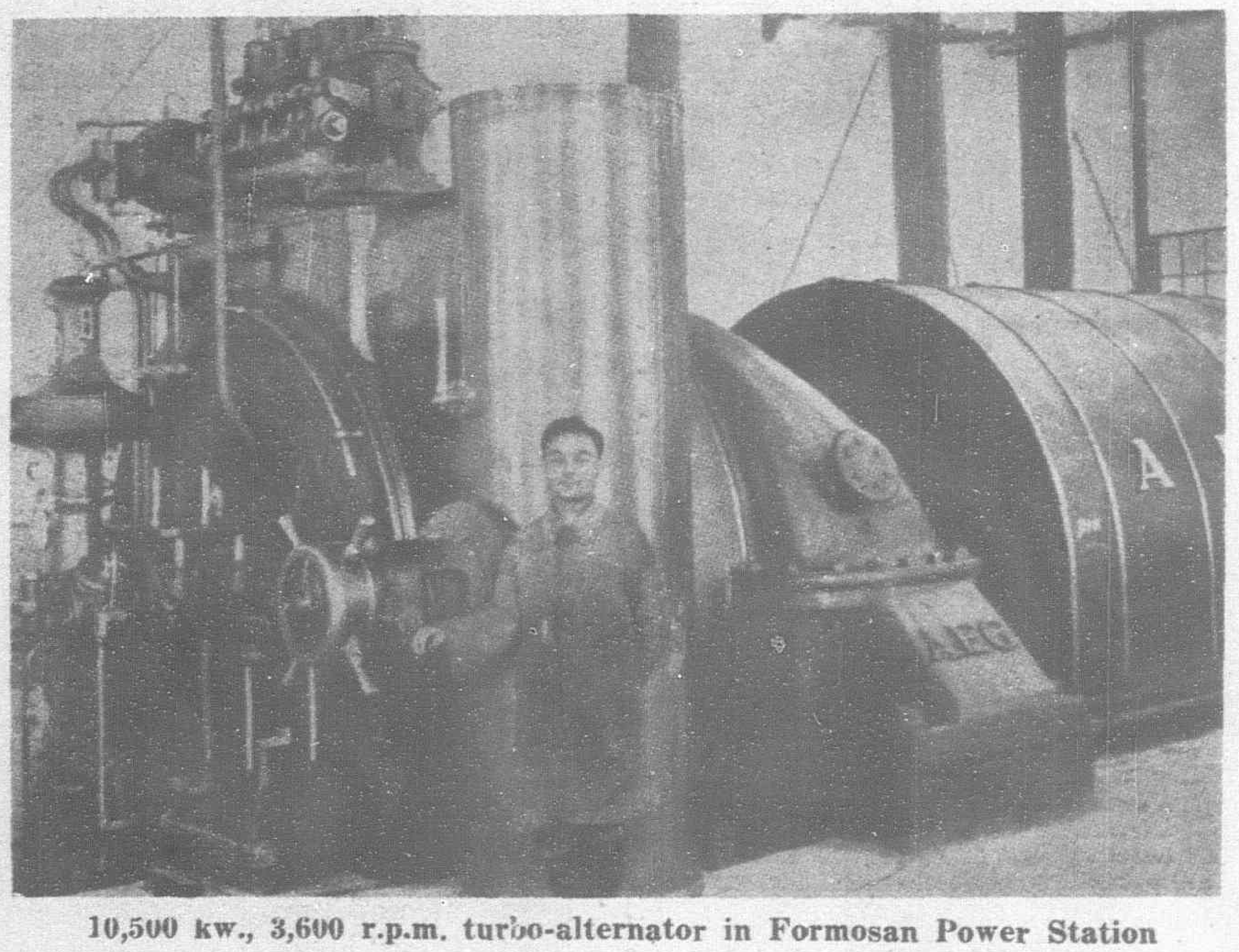
ABOUT 20 years ago, the first turbo-alternator rated for 1,000 kw. was installed on the Japanese Island of Formosa. This unit was supplied by the AEG through the firm Messrs. Okura & Co. and is still in service to-day. In consequence of the steadily increasing demand for electrical energy, which at the moment approximates 28,000 kw. for the entire island, it was essential toward the beginning of 1930 to build a new steam power station for 10,000 kw. within nine months. The construction of the buildings and also the machine plant was entrusted by the Taiwan Denryoku K. K. to Messrs. Okura & Co., whereby the AEG secured the order for a turbo-set for the above output, including switch-gear as well as the evaporating and preheating plant.

In view of the prevailing service conditions in Formosa, the new 10,000 kw. power station was designed to ensure utmost dependability, speedy setting into operation and low initial cost. Accordingly, especial value was attached to simplicity of the machine plant and also of the preheating and evaporating plant. Moreover, every effort had naturally to be made to realize the lowest possible heat consumption by employing high-class, economic machines and apparatus, and preheating the boiler feedwater by means of extraction steam from the main turbine.

The turbo-alternator supplied by the AEG is rated for 10,500 kw. at 0.8 P.F. and generates three-phase current at 11,000 volts, 60 cycles. It is the largest machine running at 3,600 r.p.m. installed in Japan, and is also the largest set as yet built by the AEG for this speed. The accompanying illustration shows the turbo-generator housed in the Japanese station.

The turbine is designed for a live-steam pressure of 23 atmos. (330 lb/sq. in.) and a live steam temperature of 375° C (700° F). It is of single cylinder pattern devised as impulse turbine with slight reaction in the final stages. The turbine is provided with a non-regulated extraction point for connection to a single-stage evaporating and preheating plant. The evaporator normally produces 2,000 kg/hr (4,400 lb/hr) net distillate and 2,750 kg/hr (6,050 lb/hr) maximum. The feed water is heated up to 80° C (175° F) in a mixed preheater.

The alternator is totally enclosed with self-ventilation and is equipped with a circulating cooler located laterally under the unit.



10,500 kw., 3,600 r.p.m. turbo-alternator in Formosan Power Station

The circulating water used for the air re-cooler is sea-water which is delivered by the circulating water pump for the condensing plant.

The surface condenser is of double-flow construction and has a cooling area of 850 m^2 (9,100 sq. ft.). The cooling water used is sea water, the maximum and average temperatures of which is 34° C (93° F) and 25° C (77° F) respectively. The circulating water pump is electrically driven and delivers about 2,800 m^3 (10,300 imp. gall. per min.).

As mentioned at the commencement, only about nine months were available for extending the power station. Allowing for the time necessary for erection, as well as about two months sea transport, the plant supplied by the AEG had therefore to be completed within five months. As this set was the first of its kind, the punctual delivery within the specified time must be regarded as an outstanding achievement of the AEG factories.

Worthy of mention is also the short time required for the lay-out and design of the plant and for concluding all transactions with the clients. Only 18 days passed from the receipt of the enquiry to the confirmation of the order. Therefore, many important details could only be elucidated after the order had been placed. Nevertheless, by the effective co-operation of all parties, it was possible to complete the machines within the guaranteed time and to execute the plant to the entire satisfaction of the client. Punctually on the 14th August, 1930, the parts left the AEG factories. Seven months after receipt of the order they had arrived in Takao, and by the end of December 1930 they were already installed.

Special attention had to be bestowed on the execution of the buildings and foundations. These were subjected to an exhaustive test during erection of the machines. Six serious earthquakes threatened in November and December to destroy the building. Happily, no damage was inflicted on the plant.

Unfortunately, the inauguration of the plant had to be somewhat postponed due to retardation in the completion of the boiler plant. However, on the 31st of January, 1931, the new turbo set supplied current for the first time and since then has been operating to the entire satisfaction of the client.

Japanese Power Companies Merge

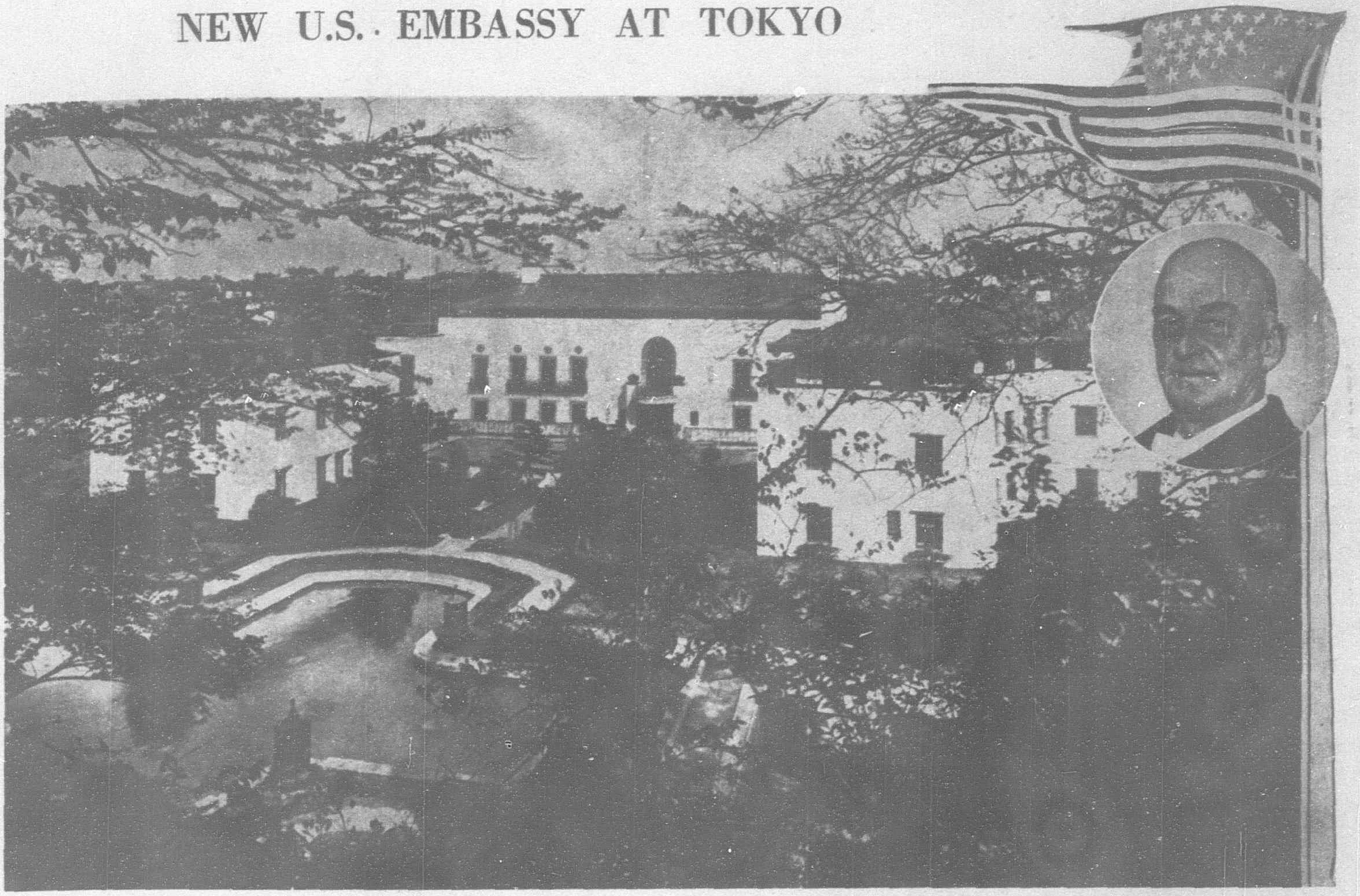
Formal negotiations for the fusion of the Hakusan Power Company and the Toho Power Company began in July between President Naruse and three directors on the Hakusan side and President Matsunaga and four directors on the Toho side.

The Hakusan is capitalized at Y.20,000,000 (Y.12,500,000 paid up), paying a dividend of 8 per cent a year, and maintains three power stations at Torigoe, Nishi-Katsuhara and Yoshinodani. The Torigoe power station (generating power 13,000 kw.) supplies the juice to the Kyoto Electric Light Company. The Nishi-Katsuhara station (generating power 20,800 kw.) used to furnish power to the Toho at the provisional rate of Y.75 per kw. a year (contracted at Y.80 per kw. a year) which contract will expire in 1933. The Yoshinodani (generating power 12,500 kw.) supplied power at the rate of Y.75 per kw. a year which contract expired in June this year.

The Toho Power Company last fall notified the Hakusan that further supply of power should be stopped after the expiration of the contracts from both stations, as the Company was going to adjust the power bought from another company. The Yoshinodani station, after the expiration of the contract, stopped supplying power. Negotiations for a cheaper rate resulted unsatisfactorily.

Meantime, the proposal gained the support that instead of the two Companies being at loggerheads over the question of rates, the two should amalgamate, solve all pending problems and carry out the unification of electric rates.

NEW U.S. EMBASSY AT TOKYO

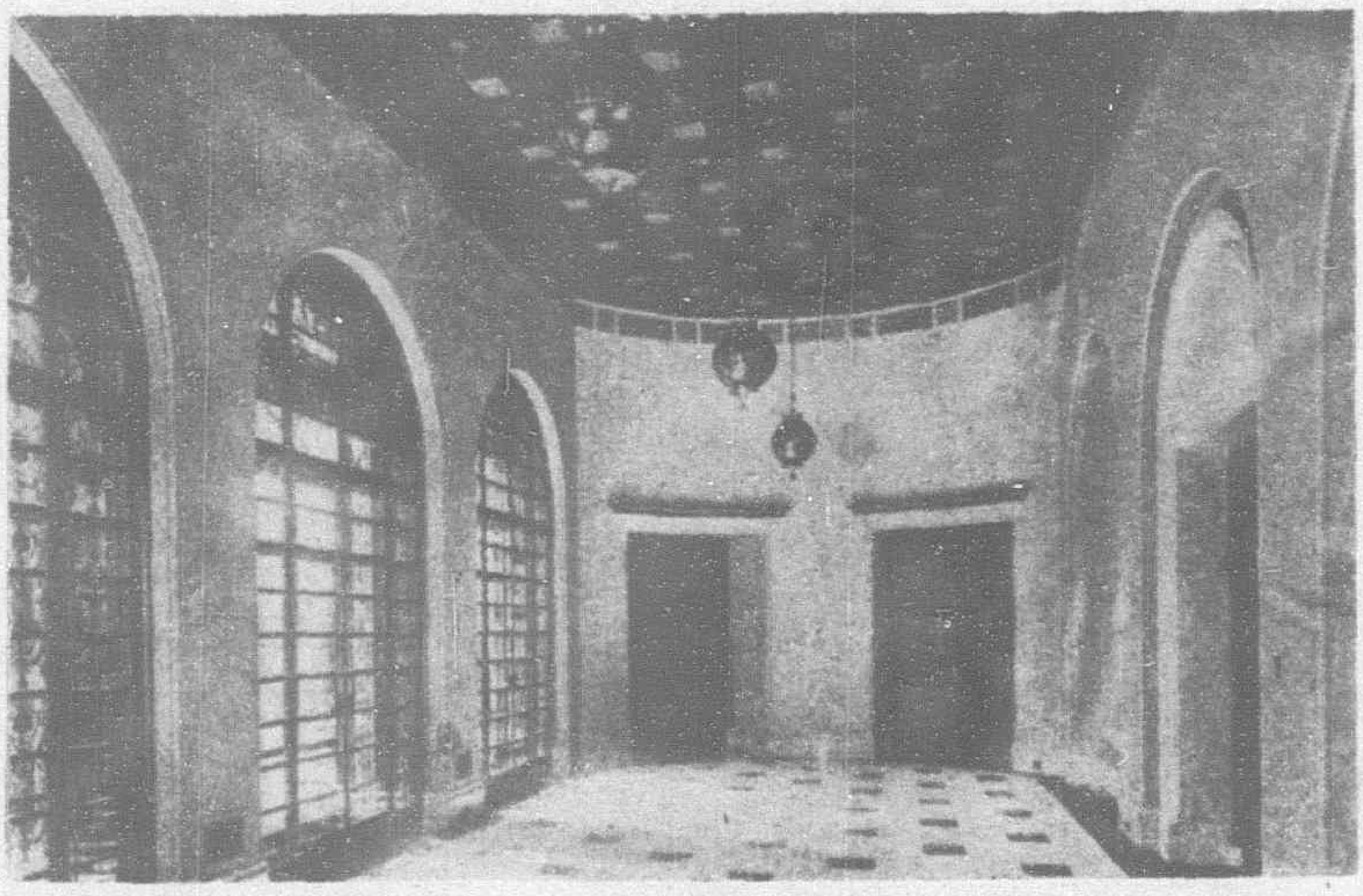


New Edifice is of Striking Design

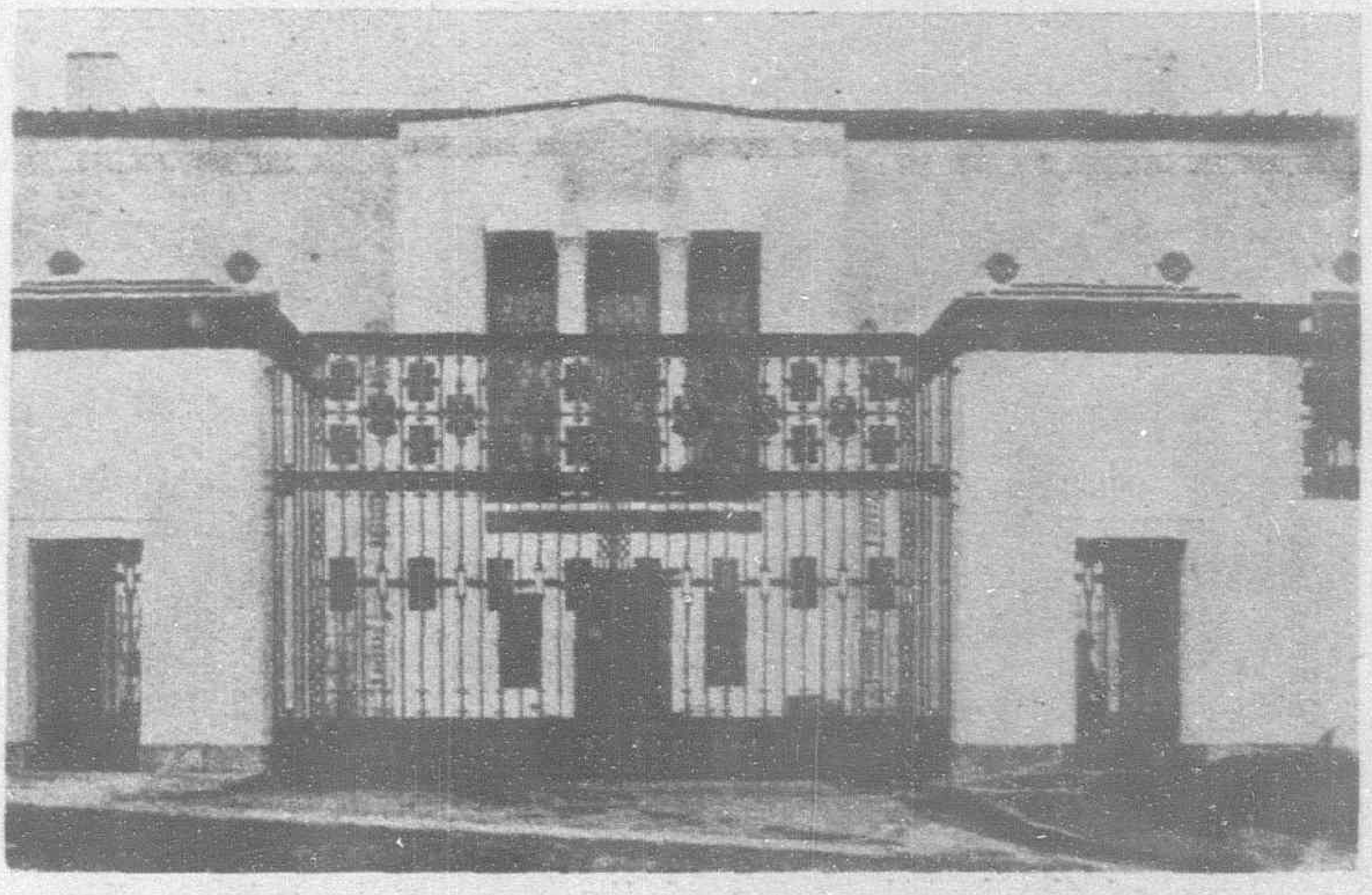
American Diplomatic Quarters Housed in Buildings Set on Two Different Levels

ALTHOUGH still incomplete in many details, the new Diplomatic and Consular Establishments of the United States of America are at last functioning in Tokyo. Moving from the former Embassy Offices in the Toyo Building to the new Chancery Building took place early in December when the American Ambassador, Mr. W. Cameron Forbes, moved into his official residence.

Plans for the new American Embassy in Tokyo have been under way since 1924, and construction was started in November, 1930. The architects are Mr. H. Van Buren Magonigle of New York City and Mr. Antonin Raymond, Architects Associated of New York City and Tokyo. All the buildings are of monolithic reinforced concrete, the original structural plans having been designed by Friedman and Cohen, structural engineers of New



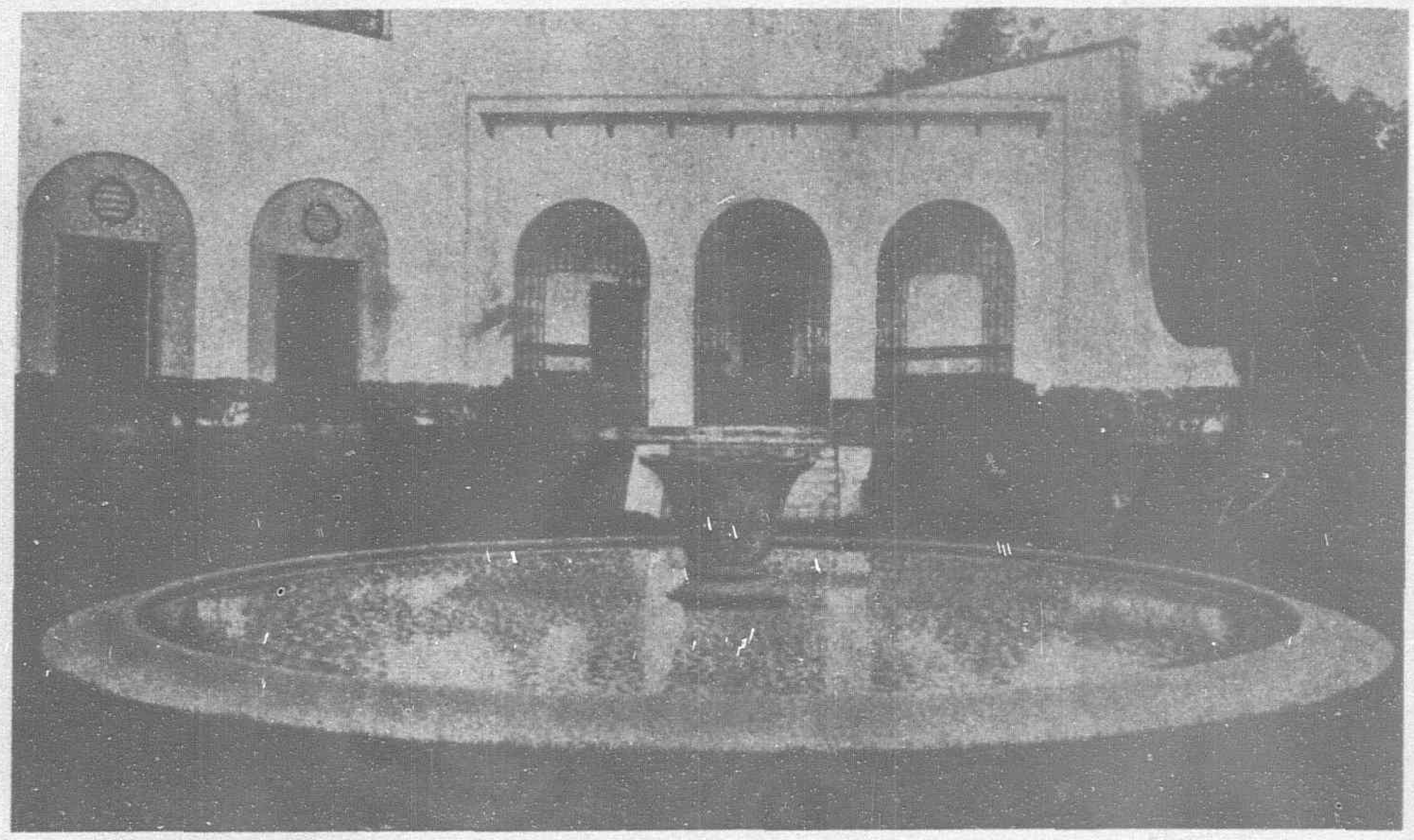
A part of the Lobby of the Ambassador's Residence. The painting work in all parts of the Embassy buildings was finished by Kametani Painting Works



Front view of the new United States Embassy. The plastering work was finished by Kamei-Gumi & Co.

York City, and re-designed in Japan by Dr. Naito of Waseda University, in order that they might properly withstand earthquake shocks.

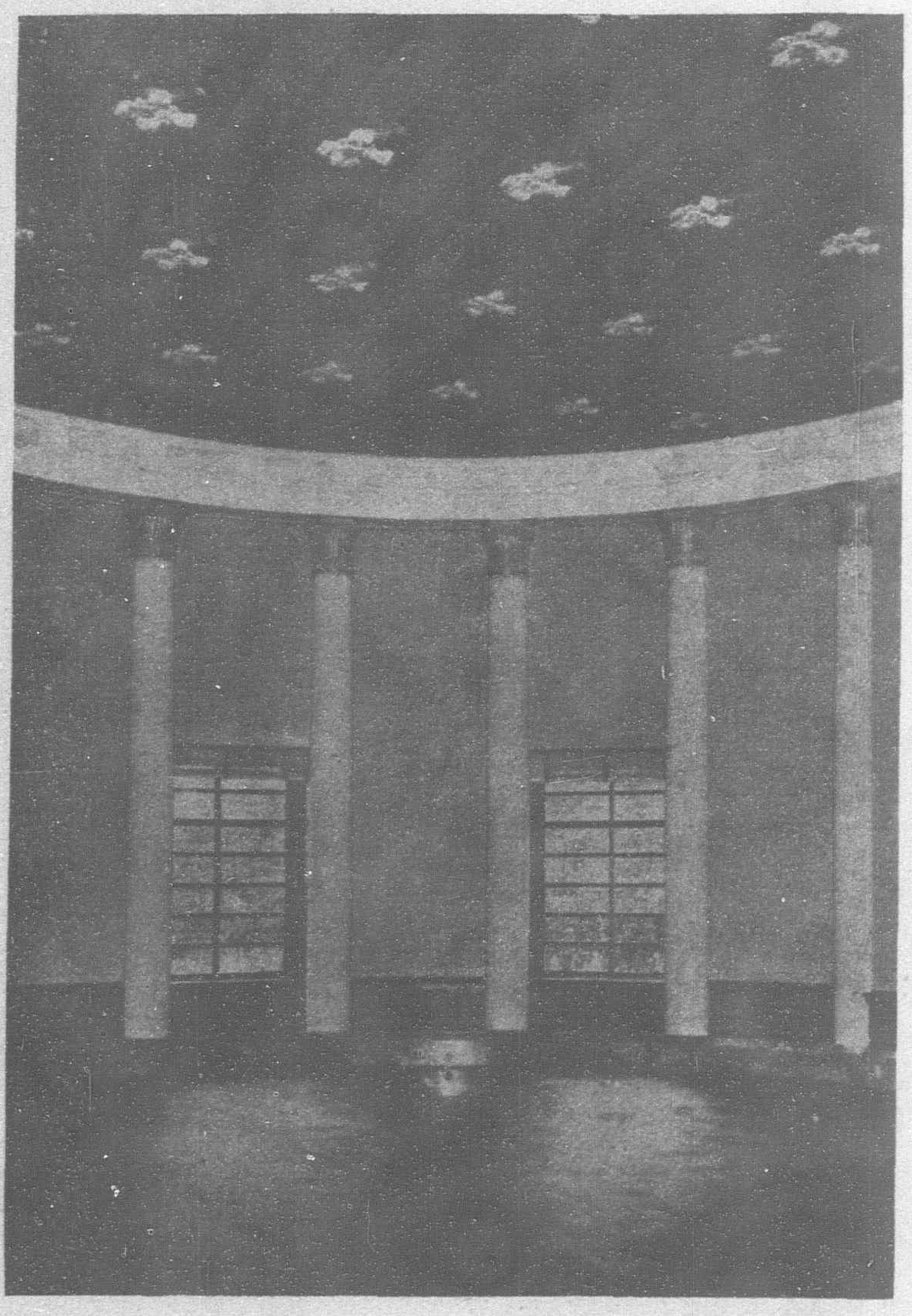
The Embassy buildings are built on two different levels on the slope of Reinanzaka Hill in Akasaka. In the upper compound is the official residence of the late Prince Ito. In the lower compound, the Chancellery Building and the two apartments for junior officers in the Embassy stand on the ground where stood the old American Embassy, which was destroyed in the earthquake of 1923.



The tea house attached to the Ambassador's residence and a part of the turf garden. The fountain and basin were constructed by Mr. Kumajiro Kumatoridani.

Main Entrance Gates

A high thick wall surrounds both compounds, and the main entrance gates to the chancellery and the residence are of heavy black iron grill work. All the buildings, as well as the outer wall, are finished with old fashioned Japanese "shikui," the same material as that used in the Imperial Palace buildings. This is a sort of stucco which is used in no other country save Japan, and its startling white color forms a most effective contrast to the black trimming used in the heavy iron grille work entrance gates, doorways and window screens, and the black terra cotta ornamental features, the parapets, heavy vases above the Chancery doorway, and the eagles on the gate posts of the outer wall.



A view of the spacious parlor. The heating and ventilation systems of the buildings are of the most modern type. The Uchida Shoji Kaisha, at Marunouchi, Kojimachi installed the heating and ventilation equipment.

The cast-iron grille work was all imported from the United States, as was the terra cotta, which came from the Atlantic Terra Cotta Company of New Jersey. A further note in the black-and-white contrast scheme is the highly polished black granite from Fukushima prefecture which is used for the bases of all the buildings.

The trees for the garden of the Ambassador's residence and the lower garden were carefully selected and are all of the evergreen variety, so that there will never be any autumn foliage to detract from the main color design of the buildings—a sharp contrast of black and white relieved by colored mosaic tile work around some of the doorways and windows, and by the blue and gold eagle medallions across the north entrance of the chancellery building.

The roofs of the buildings, very slightly sloping, are made of heavy oxidized copper, trimmed with pressed ornaments of the same material.

An Interesting Frieze

The white "shikui" finish of the buildings has an interesting frieze treatment toward the top which, is of pre-cast white stucco. The frieze on the Ambassador's residence is of conventional design, but that around the chancellery building comprises a design of fruits and vegetables representing the agricultural produce of every state in the Union.

In addition to the frieze, translucent white marble slabs are inserted into the building walls in various places and serve to lend variety and lightness. Wrought iron work is used in some places, that in the doorways of the apartment buildings being exceptionally fine in design.

Seen from the exterior, the north entrance to the chancellery building is the only full view obtainable from the street, the rest of the buildings being entirely hidden by the massive white wall which surrounds both compounds. This facade is tremendously imposing, with its huge central window of leaded glass bordered with mosaic, the opening being supported by two white columns gracefully silhouetted against the dark lead and mosaic. Directly above this large window is a medallion of the American eagle in white pre-cast stucco, and along the main wall above the smaller windows are the blue and gold mosaics also in medallions of the American eagle.

The Ambassador's residence is reached by a long driveway which is entered at the very top of Reinanzaka Hill. The entrance doors are of heavy bronze, and through these one enters into the main vestibule, which is finished with large slabs of Formosan marble, with floor in marble mosaic. At the left, an immense unsupported curved stairway leads to the upper floor. Just beyond the entrance hall is a small reception hall, and to the right is a loggia, with long windows looking out onto the garden.

Ambassador's Library

Back of this loggia is a small anteroom and also the Ambassador's private library, which is paneled in American walnut and displays an interesting ceiling treatment of pre-cast plaster decorated with medieval printers' marks.

The loggia leads on into the main ballroom which takes up a whole separate wing of the house and has four long French windows along each side, the far end being curved and terminating in three more long windows with oval-shaped tops. The ceiling in this room is especially decorative, being made of Vehosite board laid on in long panels of alternate dull blue and strips of antique gold rosette moulding. The ceilings in all the buildings are constructed of Vehosite board, and in the Ambassador's residence, special decorative features are employed throughout all the downstairs rooms.

Parallel with the small front reception room is the main dining-room, one side of which looks out on the garden. A long table runs almost the full length of this room, and this may be taken apart in sections. When used at its full size the dining table will seat about 50. Beyond the dining-room is an open loggia, where tea may be served out-of-doors, looking into the garden.

In addition to the main entrance, there is a family entrance just beyond the library leading into a hallway from which a curved stairway rises to the second floor, and there is also an Otis elevator which runs from the basement up to the second floor. In the basement are spacious storage rooms and the heating plant.

Upstairs there are seven bedrooms in all, and bath-rooms connecting the rooms in pairs.

The interior decorating has been in the hands of the State Department at Washington and was done by a committee of society women headed by Mrs. William R. Castle, Jr. A good deal of the furniture came from Sloane's in New York, and some of the rest of it was bought through individual interior decorating concerns. In the main, the scheme of decoration is early American in treatment, and a good deal of variety has been effected in the colorings of furniture upholstering and the window draperies.

Floors Vary

Some of the floors in the Ambassador's residence are of teak, which is the material used in the curved staircase, and other floors are of polished marble laid on in patterns of black and white. In fact, marble has been profusely used throughout all the buildings and is of many different varieties: Dark Formosa, Vermont, Belgian Black, Convent Siena, Breche Opal, Verde Antique, Eastman Cream, Tavernelle Fleuri, Brotticino, Verona and Tennessee, and has been imported from all over the world.

Only American woods have been used in the wood work, white pine from the East for all painted work, and oak and black walnut for the hard-wood doors and trim.

The apartment buildings, which face the Chancellery in the lower compound, are of the same general construction as the Ambassador's residence and are also earthquake proof, being built on concrete pile foundations. They are thoroughly equipped throughout with all modern conveniences, steam heat, up to date bath-rooms and kitchens in each of which a Frigidaire is to be installed. There are four apartments in each building, and on the top of each is an open loggia, screened in, which can be used for outdoor entertaining in the warm weather.

The main offices of the American Consulate Officials, and of the Commercial, Naval and Military Attachés are in the chancellery building, as is also the Ambassador's private office and the offices of the secretaries and other Embassy officials. Here the treatment of the interior is formal and business like, and the floors are covered with battleship linoleum.

The garden behind the apartment buildings and a level above the chancellery is equipped with a swimming pool and with a large reflecting pool. It is formal in style, its spacious sweeps of lawn being bordered with rows of flowering shrubs. Vines are being trained in the front of the buildings, but, of course, many of the trees and shrubs are still too new for the full effect to be realized. In spite of the many unfinished details, however, the essential features of all the buildings are complete, and now that they are all being occupied, the various unfinished items will rapidly take care of themselves.—From the *Japan Advertiser*.

The Shanghai Coal Handling Plant of the Kailan Mining Administration

(Continued from page 25).

As will be seen from the drawing of the tripper the main belt is carried up a set of idlers to a height of about 15-ft. The other belt, which is not being unloaded, passes straight through the portal of the machine. The belt is doubled back on itself and discharges its load on to another inclined belt, which raises the coal to a height of about 27-ft. This conveyor is carried on a jib, which can be slewed to a slight extent by hand gear, and is driven by a 15 horse-power motor. It will be noticed that the sides of the conveyor are protected by wind boards to prevent dust being blown off and causing a nuisance.

The coal is dumped into the hopper of one of the travelling bridges, which, as will be seen from the illustrations has what might be described as a "dog's leg" shape. These bridges have a span of 140-ft. and are equipped with 36-in. belts. The coal is carried up the inclined leg of the bridge and tripped into a hopper feeding another conveyor carried by a depending radial jib. This jib can be slewed round to command the whole of the area under the bridge and can also be dipped so as to reduce the free fall of the coal as far as possible and prevent unnecessary breakage. There is a continuation of the bridge conveyor which may be used to carry the coal to shoots on its far side. One of the shoots feeds the reclaiming conveyor No. 9, and is used when getting coal which has not been screened before stocking. It will be seen that the conveyor delivers directly to the screening house. The other shoot may be connected with the rear of the "issuing tower," when the coal can be taken through the process of screening and re-shipped directly by the tower without being put on to the storage ground, the difference between this system and that of shipping by the small conveyor No. 20 being that the issuing tower is mobile and can command a larger vessel.

The issuing tower, as will be seen from the drawing, is a cantilever structure running on rails near the river front, and commands the main storage yard. The cantilever has an outreach of 65-ft. and is equipped with a grab of 2¼ tons maximum capacity. The grab itself weighs 2½ tons. The speed of hoisting is 270-ft. per minute, and gives an average output of 150 tons of coal an hour. The coal, as it is grabbed, is dumped into a hopper in the main tower of the machine, and goes through a weighing machine to a belt conveyor spanning the track towards the riverside. This belt is 30-in. wide and runs at 320-ft. per minute. Reaching out over the water there is a jib which carries a loading conveyor of the same capacity. This conveyor has a telescopic end, which can be extended 15-ft. and gives a maximum outreach of 60-ft. The idlers on this telescopic section are connected by means of a system of "lazy tong" links, so that their pitch is adapted to the length of extension. It can also be luffed up and down to suit the height of the tide and save the breakage of coal as it is fed to the lighter. There is also a chute from the hopper into which the grab delivers, that may be used to supply two small platform-weighing machines for the issue of coal to carts in lots of two cwt.

The coal, which is put into the reserve store behind the issuing transporter, may be run-of-mine, lump, or slack. When it is necessary to fall back on this reserve, a steam grab on caterpillar tracks is brought into service. It is capable of handling about 150 tons an hour and dumps the coal into the hopper of one of the transverse bridge conveyors. The coal can then be sent to the screen house for cleaning, or shipped away through the issuing tower.

Stanley Power Station at Colombo, Ceylon

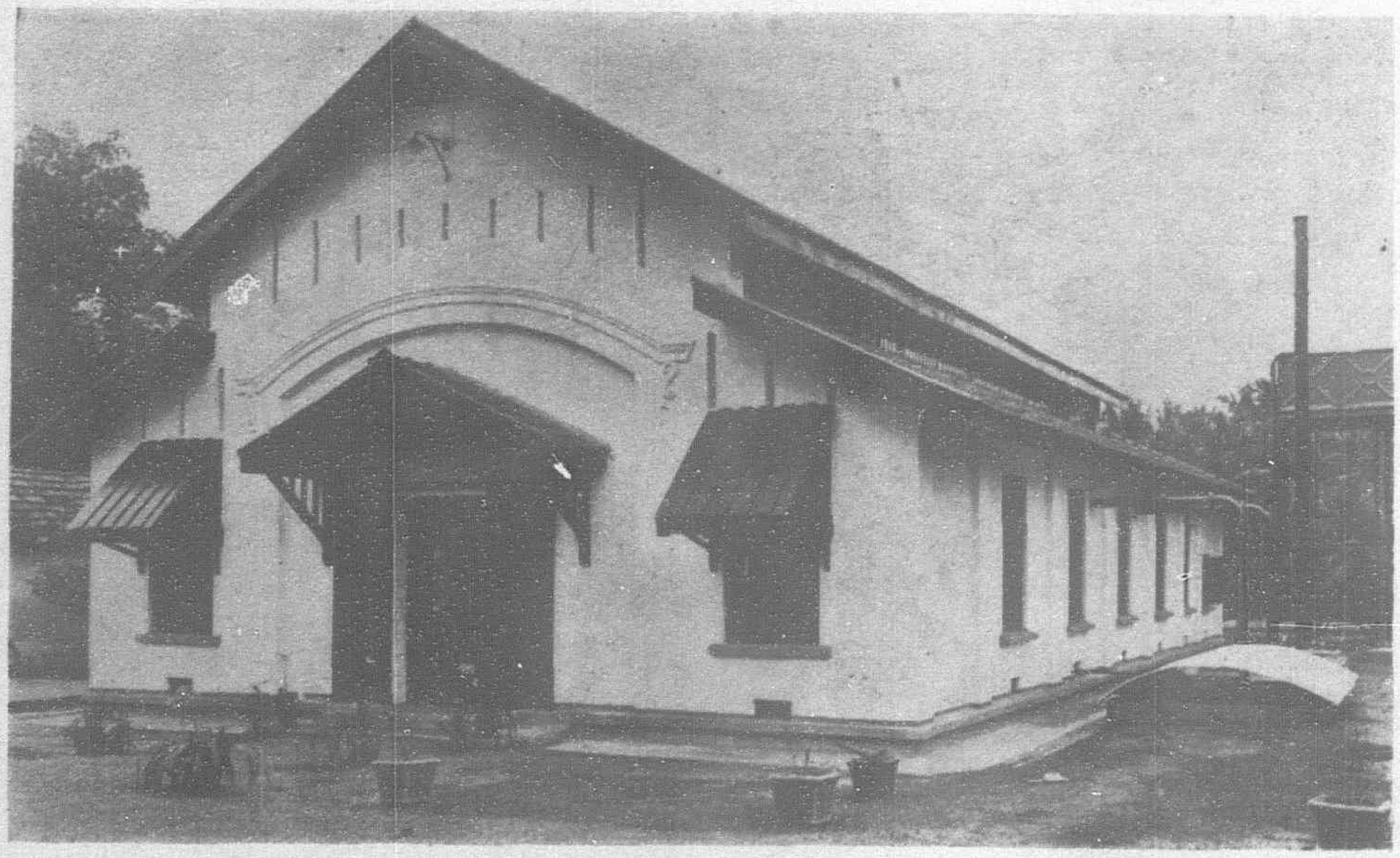
Electrical Engineering in Ceylon

Over A Quarter of a Century

THE following interesting review of Electrical Developments in Ceylon, written by Major E. F. Lynn, Director of Electrical Undertakings, at Colombo.

A review of the progress of electrical engineering in Ceylon during the last 25 years is the story of a modest beginning and a steady progress towards the dawn of a new era as marked by the opening of the Stanley Power Station last year. Its mains, radiating within the City of Colombo and as far as Negombo on the north and Kalutara on the south, will develop the industrial and social aspects of the province (and later, the country), to such an extent, that when the supply of current from the hydro-electric scheme is introduced, the fullest utilization of the country's resources will only be a matter of time. The purport of this article is to give a brief survey of electrical engineering and its progress in Ceylon during the period under review, and its relation to private enterprise in general, and Government undertakings in particular.

The history of electricity supply in the City of Colombo dates back to the year 1895, when Messrs. Boustead Bros. opened a small power station in the Fort. This station, equipped with gas engines, dynamos and accumulators, was opened in July of that year, and supplied electric light to a few offices, some Government buildings and the streets in the Fort area. Shortly afterwards the business was taken over by the United Planters Co., and this Company extended the Fort lighting system and constructed the Colombo Tramways, which were formally opened in January, 1899. In 1902, on the formation of the Colombo Electric Tramways and Lighting Co., Ltd., a single phase 2,200-volt 60 cycle supply was commenced from steam driven alternators at the Pettah Tramways Power Station, the first areas supplied being Galle Face and Colpetty by means of overhead mains, but further overhead main extensions were objected to by Government and the Colombo Municipality. The H.T. single phase system was then gradually extended by means of concentric underground cables to cover the greater part of Colombo, the 2,200-volt supply being transformed down to 100-volts for consumers' premises.



A typical small power station building in one of the smaller towns of Ceylon

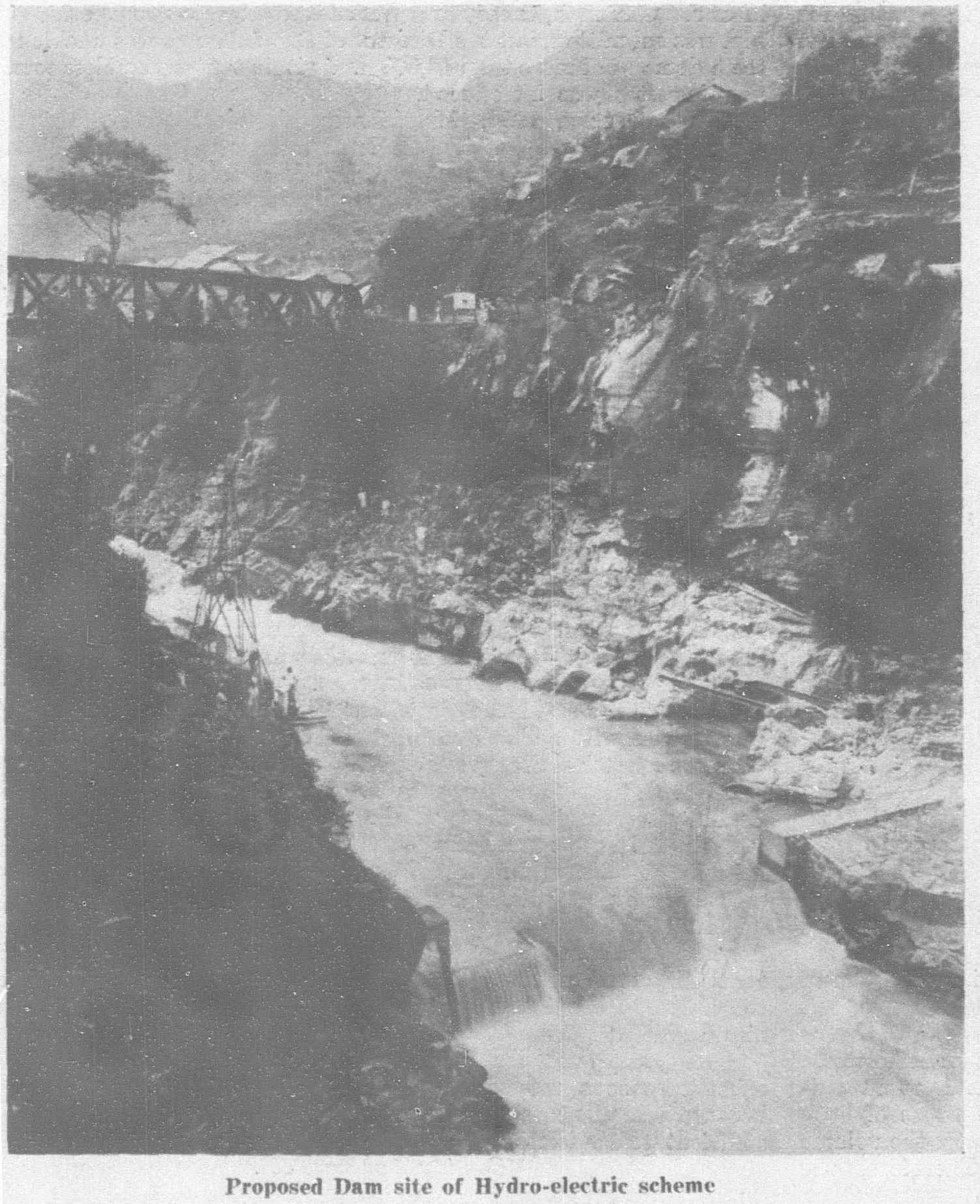
Birth of a Department

Mr. A. S. Barnard's appointment in 1903 as consulting electrical engineer to Government and the Municipal Council, saw the start of a wider interest on the part of Government towards developing electricity in Ceylon. Mr. Barnard was succeeded in 1907 by Mr. F. B. Rylands as Government electrical engineer, attached to the Public Works Department. This step really marks the birth of a branch whose activities were to grow to such an extent that it was only a matter of time before the creation of a separate Department of Government was indicated. About this time Sir Henry McCallum took up the reins of Government, and as he himself was a Royal Engineer, the activities regarding matters electrical in Ceylon loomed more in the public eye.

NUWARA ELIYA.—Sir Henry McCallum looked into the question of lighting Queen's Cottage at Nuwara Eliya, and in 1908 a 2 kw. D.C. lighting plant was installed. Subsequently the possibilities of a hydro-electric scheme for Nuwara Eliya were proposed by Sir Henry and conveyed to the electrical engineer through the Director of Public Works. Investigations on this matter began in 1909 and occupied a period of nearly 18 months in exploratory works and completing details. Two small gauging weirs were erected one at the Gregory Lake Spill and the other on the Ladies Water Fall on the Elk Plains, and finally the present site at Blackpool was selected.

View showing general arrangement of Works. The top of the Dam will be at the road level at the left

Construction works were started forthwith and speedily proceeded with enthusiasm, the civil portion being in charge of the factory engineer, and the electrical work under the direct supervision of the Government electrical engineer. A noteworthy contrast to the present scheme being that a pressure pipe line was laid from the lake intake right through to the power house. The whole scheme was completed and opened on March 15, 1912.



Proposed Dam site of Hydro-electric scheme

The plant installed consisted of two 40 kw. 60 cycle single phase alternators, direct coupled to two 70 h.p. impulse turbines working under an effective head of 190-ft. H.T. current was supplied from the power station at 2,200-volts to the transmission lines and stepped down (by means of transformers located at central points) to L.T. current at 110-volts for consumers and 220-volts for street lighting. The supply was given at first to about 800 lights in the town, Queen's Cottage and a few hotels being the first consumers. The tariff for charging consumers as prepared by the electrical engineer was adopted by the Board of Improvement and is still in force, having given general satisfaction to the public and Government.

At the start certain troubles were experienced with the governing of the turbines (pelton wheels) which were controlled by oil pressure bearing direct on to the regulating spikes. Subsequently the consulting engineers (Messrs. Preece, Cardew and Rider) recommended that "no improvement in governing can be expected unless jet deflectors are added and the governors made to work upon them instead of upon the spear nozzles." This recommendation was adopted and no further trouble was experienced in the turbine governing.

Enormous Increasing Demand

The demand for electricity for lighting grew to such an extent in a few years that the necessity for extending the system was raised by Government, and in 1915, as the load could not be faced with the existing sets, an additional 80 kw. single phase 60 cycle alternator, direct coupled to a 120 h.p. impulse turbine, (pelton wheel) was added. This was put into commission, but the full output could not be taken as the pipe line was found inadequate. This brought forward the question of duplicating the pipe line and increasing the water supply at the turbines. Several suggestions were made, but ultimately the present system, *viz.:* intake, conduit, forebay, two pipe lines to power house to operate on a net head of 200-ft. was adopted, and is giving satisfaction to date. The growing demand for current in and around the town necessitated a further increase of output, and in 1927 it was decided to add a 250 kw. 50 cycle 1,000 r.p.m. direct coupled turbo alternator unit. New transmission lines were laid to Nanu Oya and the whole distribution system converted into three phase.

KANDY.—In the early part of 1905 the Colombo Gas Company installed a small electric lighting plant in Kandy. The plant was bought over by the Municipal Council of Kandy in 1925 and to-day is run under its sole supervision and control, but the advice of the Director of Electrical Undertakings is sought in matters relating to important changes and additions. The Electrical Department also makes periodic inspections and reports on the condition of the plant generally.

At present power is generated by oil fuel internal combustion engines, occasionally assisted by a small plant (oil fired), the installed capacity of the plant being 200 kw. A.C. at 3,300-volts and 300 kw. D.C. at 440 volts. Supply to consumers is mostly metered, but there are a few lights on a restricted supply and charged on a monthly basis. The demand for current within and around the town is so rapidly increasing that it is proposed to add another 250 kw. D.C. set and extend the distribution system to Katugastota, Peradeniy aand Ampitiya.

Galle

In 1912 the Galle Municipality requested Government to provide a loan for the installation of an electric lighting scheme. Estimates were prepared and submitted, but the Great War intervening the matter was dropped in 1914, to be revived again in 1922. In 1924 Government had prepared its scheme and agreed to do the work which was actually commenced departmentally by the Public Works Department in 1925. Two 55 kw. vertical sets and one 18 kw. horizontal set were installed and in operation in 1926. Since that date, owing to the increase in demand for electricity at Galle, it was necessary to increase the plant, and the power house building was enlarged and two 110 kw. vertical sets were installed.

SMALL TOWN LIGHTING SCHEMES.—One of the most decisive steps towards popularizing electricity in the interior parts of Ceylon was the introduction of the Small Town Lighting Schemes. This was mainly due to the efforts of Mr. J. G. (now Sir John Fraser), C.C.S., the then Government Agent of the Western Province.

The first small town to have electric lights from its own power station was Gampaha. The complete installation work consisting of 9 kw. 230/240-volts generator driven by a 17.5 h.p crude oil engine, and a pumping set for the town water supply was carried out by the Public Works Department and opened in August, 1922. Since that time several towns from different parts of the Island through their local representative bodies (U.D.C., Sanitary Board or Municipal Council) have obtained or are agitating for their own lighting system. Most of the Sanitary Board towns prefer to have their plant run by Government, but the others have their own management and rely on the Director of Electrical Undertakings as a Consultant. Up to the end of February, 1930, there were 16 such towns with a total, installed capacity of 700 kw. Six more, representing another 460 kw. are expected to be working before the end of this year (1930). It is of interest to note in passing that the three phase distribution system was first introduced in Ceylon in 1925 at Wattegama, the plant consisting of a 18.75 k.v.a. 50 cycle belt driven alternator, working at a pressure of 415-volts between phases and 230-volts between each phase and neutral.

Several engineering firms in Colombo started branches for electrical contracting work, and great activity has been shown in the past ten years in the electrical lighting equipment of tea and rubber factories and estate bungalows, and where sufficient water power existed on estates many power transmission plants for the electrical driving of factories have been installed. It may be said that there is not a tea or rubber factory of any importance that has not now at least an electric lighting installation.

BULK SUPPLY OF ELECTRICAL ENERGY.—The increased use of water as a source of power, especially hydro-electric power, has been of late increasingly recognized throughout the world as a very important agency in national reconstruction, nay as the nerve system of every community, in that it has great direct and indirect advantages. It supplies the immediate and prospective needs of both private individuals and local industries; and the greater the volume supplied and consumed the cheaper the unit. Therefore, the development of power, whilst reducing the cost of living, invariably contributes towards the general development of a country.

Hydro-electric Energy

While other countries less favorably endowed by nature in this respect are making headway with their limited resources, over 600,000 h.p. of unharnessed potential energy is continually running to waste in Ceylon. As the question of a large supply undertaking was being considered by Government, Mr. F.B. Rylands, the Government electrical engineer, began to investigate the possibilities of water power, and on November 25, 1910, reported thus: "Sufficient water power near Laxapana will, I think, be available for the total requirements of Government. The power available to a large extent can be verified during the next dry season: February, March, April and May. Assuming that sufficient water is available the transmission will be approximately between 60 and 70 miles from the falls to the first station, which could be conveniently situated near the Demetagoda Railway Depot."

However, much progress on this subject lay dormant till 1914, when the Controller of Revenue Mr. (now Sir. J. G. Fraser), recommended that the services of a specialist be obtained to report on the "great asset" of water power in Ceylon and the best means of converting this power into electrical energy. Subsequently the Director of Public Works who had been considering this subject for some time was asked to complete his investigations and to prepare material for the expert to work on.

The outbreak of the Great War in August, 1914, delayed further progress for some time, but in 1916 the Director of Public Works detailed Mr. D. J. Wimalasurendra, district engineer, to carry out this work. In a paper entitled "Economics of Power Utilization in Ceylon" Mr. Wimalasurendra mentioned the results of his investigations. After further study, a scheme planned by Messrs. Chapman, Creasy and Wimalasurendra, to produce 75,000 h.p. was submitted, but the Director of Public Works was unable to see a demand of more than 40,000 h.p. within ten years unless some new industry was introduced.

In February, 1920, Mr. Meares, electrical adviser to the Government of India, visited Ceylon and reported on the project, and in November of the same year Mr. F. Bolton also submitted his report. Other visits to the Colony were paid by Mr. A. H. Preece and Mr. Evan Parry, and finally in January, 1924, Mr. J. Strachan, Director of Public Works, moved in the Legislative Council the approval of the Hydro-electric Scheme known as Scheme B. Stage 1. The motion was unanimously adopted and the work of construction was thereupon put in hand.

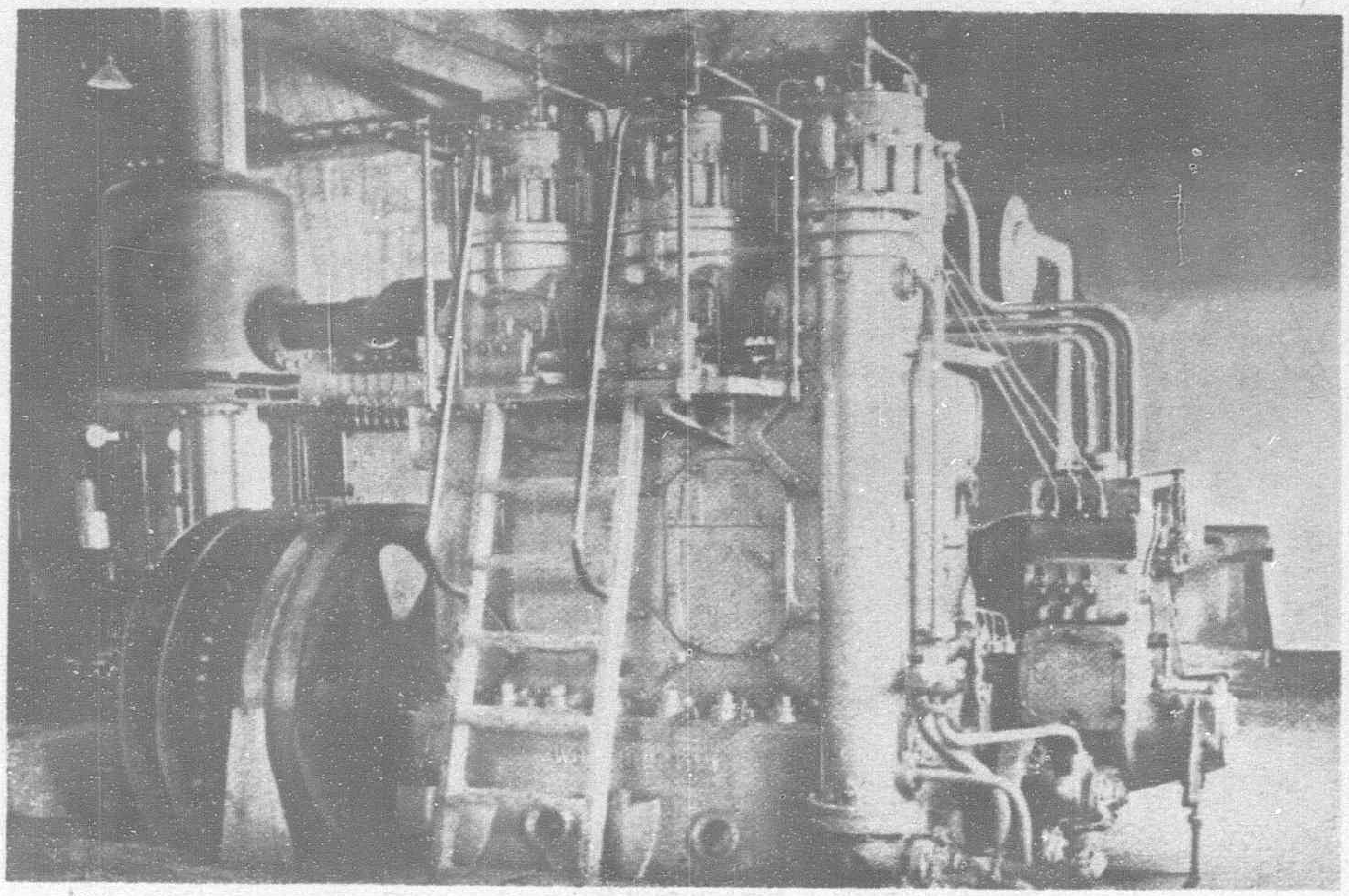
In 1927 the work was closed down as far as it was possible pending handing over the whole scheme to a new Electrical Department which the Government had at the time decided to establish. In July, Mr. B. G. de Glanville was appointed Director of Electrical Undertakings, and in February, 1928, was succeeded by Mr. J. S. Pitkeathly as director and chief engineer. Major E. F. Lynn arrived in Ceylon in January, 1929, and assumed duties as director and chief engineer in succession to Mr. Pitkeathly.

Mr. Pitkeathly and Major Lynn both examined the scheme in detail, and their findings have been recently published as a Sessional Paper. The reports indicate the measures that should be undertaken to deal with the present unsatisfactory position.

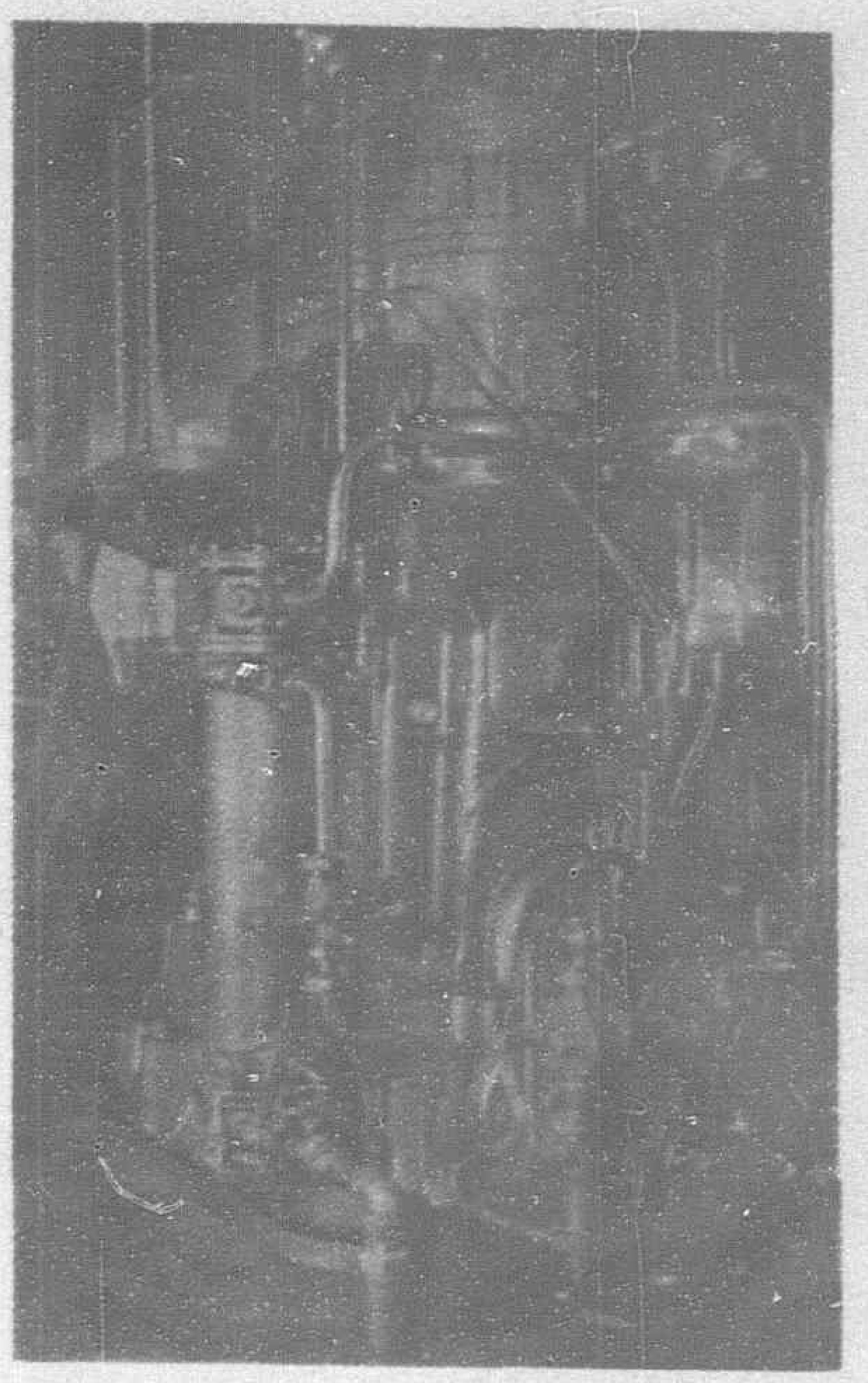
THE STEAM GENERATING STATION.—When it was decided to proceed with the Hydro-electric Scheme in 1924, negotiations were opened with a view to acquiring the lighting business from the Colombo Electrical Tramways and Lighting Co., Ltd. Eventually in June, 1927, the purchase was made. The Department of Electrical Undertakings, which was to administer the Hydro-electric Scheme and the Colombo Electricity Supply Business, actually came into being in October, 1927 and on January 1, 1928, the new department took over the Company's lighting undertaking.

In 1927, also acting under the advice of the Hydro-electric Advisory Board, the Government decided to erect a modern steam generating station to supplement the existing plant acquired from the Colombo Electric Tramway and Lighting Co., Ltd. It was also decided that the Colombo distribution should be three phase 50 cycles, and the "change over" of existing consumers should be effected as soon as possible. These steps were found necessary because the plant taken over from the Company was found insufficient to cope with the growing demand for the supply of

(*Continued on page 43*).



With engine shown in the accompanying illustration this Worthington Diesel handles a peak load of 110 kilowatts



This 100 h.p. two cylinder, two-cycle Worthington Diesel engine was installed in 1926. Direct connected to a 90 kva. three-phase, 60-cycle, 2,300-volt generator, its maximum load was 39 kilowatts

Diesel Engines Solve Problem of Small Public Utilities

Two Units at Dagupan, Pangasinan, Philippine Islands, Supply Nine Near-by Communities; City is Center of Rich Area

DAGUPAN, approximately 125 miles northwest of Manila, has a population of about 40,000 and is the principal city of the Philippine province of Pangasinan, on the island of Luzon. One of the largest rice-growing districts, this province also produces great quantities of sugar, corn and copra. Salt also is an important commodity, being manufactured in the saline marshes throughout the province. Primarily a trading center for this rich district, Dagupan boasts a number of manufacturing establisments.

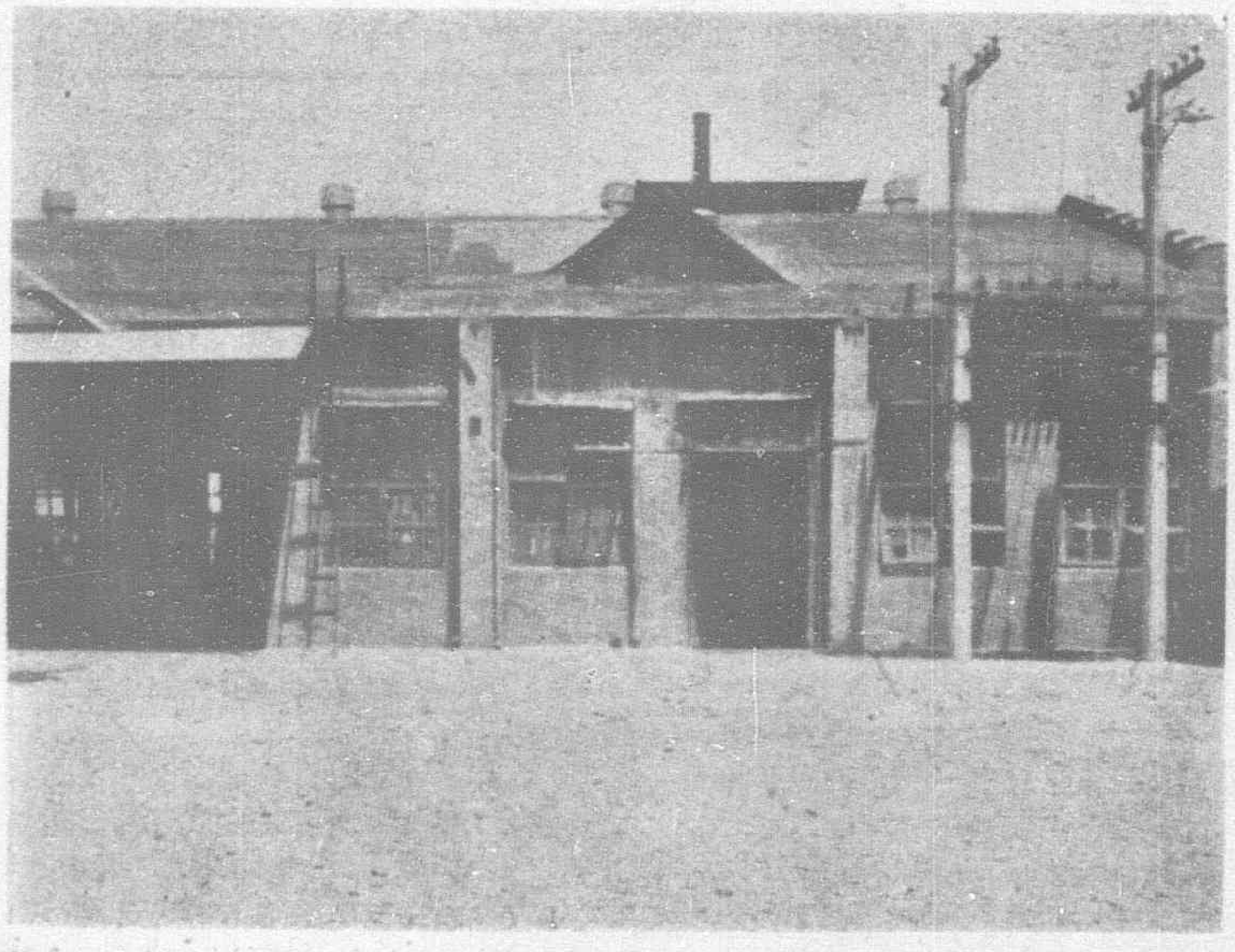
To furnish the city with electric light and power, the Dagupan Light and Power Company, a subsidiary of the Manila Electric Company, in December, 1926, installed the first Worthington Diesel engine in the Philippines. This was a 100 h.p., two cylinder, two-cycle unit direct connected to a 90 kva., three-phase, 60-cycle, 2,300-volt Westinghouse generator and exciter. The maximum load on this engine was 30 kilowatts.

Steadily increasing demands for power soon overtaxed the facilities of the first engine and made necessary the installation of a second in 1928. This time a 180 h.p., three cylinder, two-cycle Worthington Diesel engine was selected. The new unit also is direct connected to a three-phase, 60-cycle, 2,300-volt Westinghouse generator and exciter. The peak load on both engines now is 110 kw., the original unit operating on day-load service.

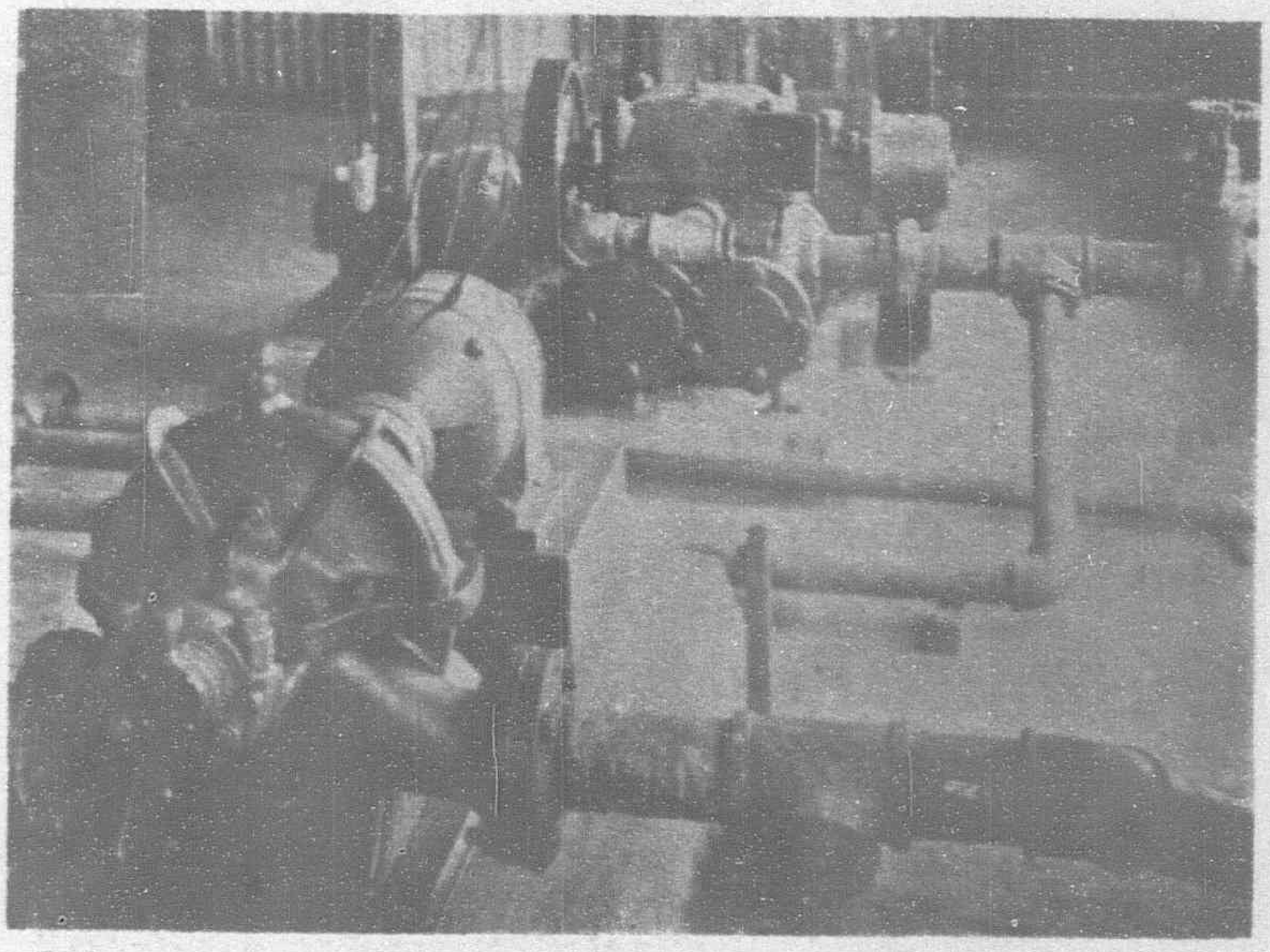
To furnish cooling water for the engines, a direct connected electric motor-driven centrifugal pump and a horizontal duplex power pump, motor driven through gears, have been installed. Both of these units are of Worthington manufacture.

Three communities outside of Dagupan also are furnished with light and power from this plant. Lines now are being built to reach five other towns, thus making the city an important power center.

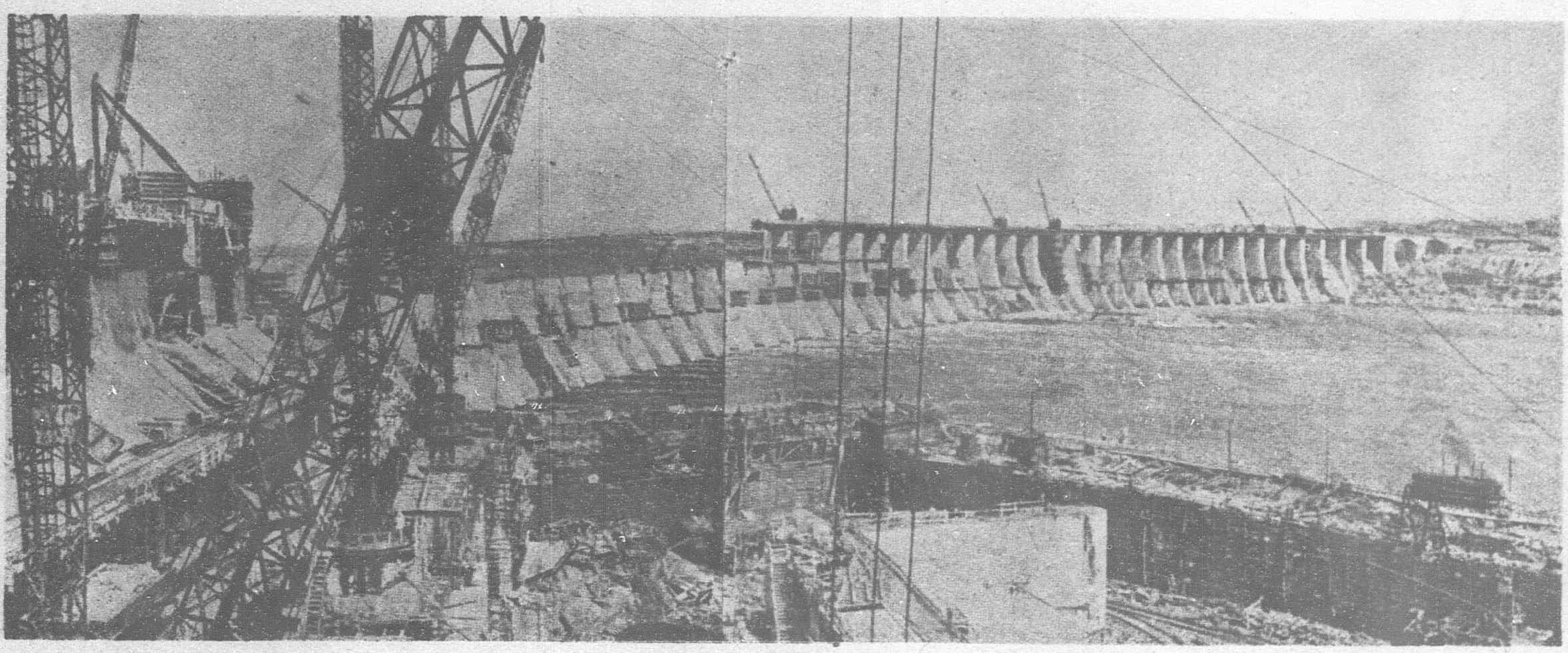
This installation is but one of many in the Philippines daily demonstrating the dependableness and economy of Worthington Diesel engines in the field of public service and industrial power supply.



Dagupau Light and Power Company plant, Dagupan, Pangasinan, Philippine Islands. Diesel engines do not require the elaborate housing and foundations needed for other machinery



Cooling water for engines in provided by a direct connected motor driven centrifugal unit in foreground and by a gear-driven power pump shown back—both built by Worthington



Dnieprostroy: A Panorama of the Great Dam under construction

The Use of Hydro-electric Power in the U.S.S.R.

An interview with Professor I. G. ALEXANDROV, Originator of the famous Dnieper Hydro-electric Scheme—the largest Power-station in the World

A TALK with Professor Alexandrov may truly be said to give an amazing impression of what is being done to-day and of what is being planned for the future in the utilization of the water power dormant in the Soviet Union.

Professor Alexandrov pointed out that the U.S.S.R. possesses numerous large rivers which, as he said, "provide the guarantee of a potentially enormous reserve of power," the extent of which can only be approximately estimated at present. Even an approximate estimate gives some 120 million horse-power, with a guarantee of six months' supply under normal conditions.

The task confronting the Soviet Union is that of choosing the cheapest and most accessible sites for hydro-electric stations, where natural conditions ensure economy in the utilization of the source of power, and where the use of thermal power would involve greater cost.

Up to the present time hydro-electric construction in the U.S.S.R. has been developed in the North-Western districts; near to Leningrad; in Karelia; Murmansk; and also in the Caucasus, where cheap fuel is difficult to obtain.

The station being built on the banks of the Dnieper, near the town of Zaporozhe is to have a capacity of 940,000 horse-power and will provide 2.5 billion kilowatt hours per annum. Professor Alexandrov, whether out of modesty or because he was more interested in giving details of yet bigger stations which are being planned, only mentioned in passing, this enormous piece of work. It is, however, well known to our readers, and the illustrations shown in this number speak for themselves.

Professor Alexandrov referred to the two hydro-electric stations which are built in Turkestan, close to Tashkent on the River Chirchik. These will have a capacity of 300,000 h.p., and will be laid down in 1932. This river, which rises in the western chain of the Tien-Shan Mountains will enable the stations constructed along its course to develop two million horse-power, and the narrow gorges, considerable fall of the river, and other conditions will make it possible to produce power at the cost of not more than 0.15 pence per kilowatt hour. This power is destined for the service of plants engaged in electrolytic processes, production of copper and zinc and also manufacture of chemicals.

Dnieprostroy: Mounting the Second Huge Turbine

Great Siberian Stations

Preliminary work is already being started on the planning of an enormous station on the shores of Lake Baikal, where the Angara River flows out of the lake. This river over a distance of 1,100 miles has a fall of about 1,540 feet. At its source the flow is not less than 1,500 cubic meters per second,

Dnieprostroy: New Workers' Town built near the New Station

whilst in its lower reaches the flow is 2,500 cubic meters per second. A dam will be constructed across the river at its junction with the lake, making it possible to regulate almost perfectly the efflux of the river and enabling about 16 million horse-power to be developed at the stations, with a supply of 75 billion kilowatt hours.

The steep banks of the Angara River afford the possibility of concentrating the production of power at six or seven stations, of which the largest, situated on the rapids at the village of Bratski Ostrog, will develop 3,700,000 horse-power.

Professor Alexandrov pointed out that the construction of such enormous stations will naturally call for great resources and a long period of time for preliminary investigation, planning and construction. Nevertheless, he emphasized that not only the River Angara, but also its tributaries, constituted an excellent source of electrical energy, which would be utilized in the future. The River Irkut can give 400,000 horse-power, the Tasev 1,270,000, the Uda 840,000 and the Selenga 1,400,000.

The existence of three coal districts in the Angara Basin, with reserves of coal exceeding one billion tons introduces a new factor, said Professor Alexandrov, into the problem of power, involving the drawing up of a plan of gradual development covering the whole area. That plan must provide for the simultaneous construction both of an electric power system and of all the works, settlements, roads and mines necessary to the exploitation of the coal and other mineral riches, the establishment of cement works and so on. Eighty per cent of the total area is covered with forest of which 50 per cent is pine, the remainder being mainly fir and cedar. In many districts there are large deposits of iron, copper, lead, zinc, gold, etc.

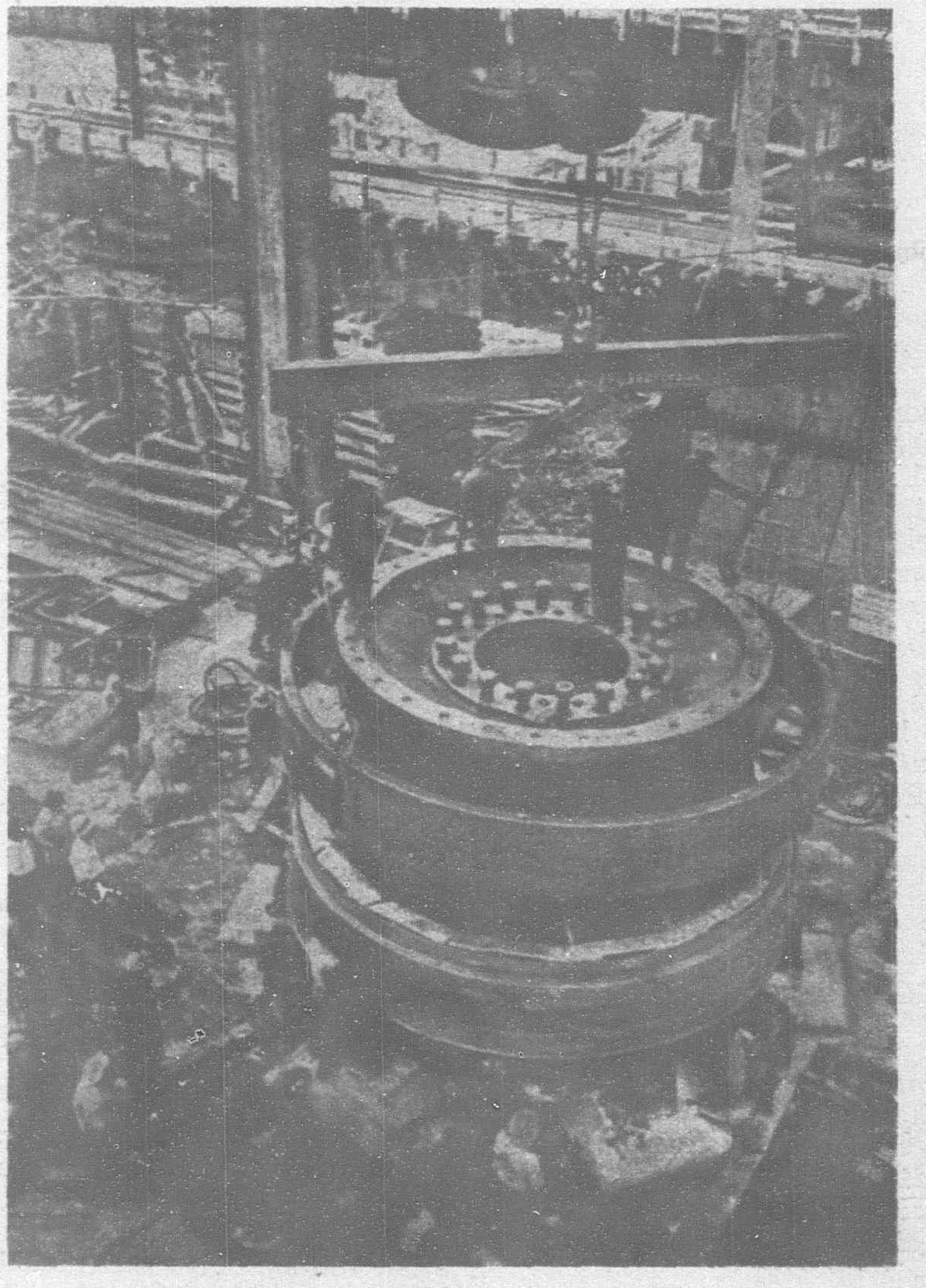
Professor Alexandrov stated that the problem of developing this vast area is at present being dealt with by the construction of a thermal-power station at the village of Cherentsevo, with a capacity of 50,000 kilowatts and another thermal-power station close to the River Kamka. Not until 1933 will work begin on the construction of the first hydro-electric station on the River Irkut, with a capacity of 300,000 horse-power. The further development of power supply in this area will be spread over a number of years, the objective being the complete use of all hydro-electric energy in the district.

It is estimated that the cost price of current supplied by the Angara River station will be extraordinarily low and will not exceed 0.1 penny. Professor Alexandrov expressed the opinion that this would render the industrialization of the surrounding area inevitable, the tendency being toward the utilization of the power for electrical processes in the chemical industry, light metals and the finer kinds of steel, aluminium, etc.

Other regions of Siberia are considered as suitable areas for development of hydro-electric power, these being the upper mouth of the Yenisei and Irtysh Rivers. In Kazakstan the river Chu offers potential power, as also the River Karin in Central Asia, and many others.

Speaking on the uses of hydro-electric power, Professor Alexandrov remarked that its production was always associated with other cognate tasks, such as water transport, irrigation, etc., and the combination of this work with the work of a hydro-electric station leads to a cheapening of the entire service, a matter to which special attention was being given by the Soviet Government.

Professor Alexandrov then dealt with the necessity for a complete planning system in connection with the development of power stations and the economic exploitation of industrial and other enterprises, and remarked that the construction of hydro-electric stations in the Soviet Union was



Dnieprostroy: Assembling a New Turbine

largely a new problem. It was, however, closely related to the problem of housing and the supply of service to new towns and workers' colonies.

All this had necessitated very serious attention being given to the study of construction work abroad, especially in America and Germany. Owing to the extensive development work which was being carried out in the U.S.S.R. and which was hitherto unprecedented anywhere in the world, it was not always possible to obtain from abroad all that was required in mechanical equipment, and this meant that Soviet engineers and workers were confronted with considerable demands on their skill.

With the second "Five-year plan" it is proposed, said Professor Alexandrov, to raise the hydro-electric power in the Soviet Union from 20 to 25 per cent above that now generated.

Electrification of Transport

One of the most important measures in the reconstruction of railway transport now being carried through, is electrification and great attention is being paid to this. The necessity of development in electrification of transport is due to the following reasons. Goods traffic in the U.S.S.R. is increasing at a great rate. In 1932 it will reach about 400 million tons, and in 1933 will be more than 500 million tons. It is sufficient to say that the U.S.A. railways required eight years to raise their goods traffic from 300 to 500 million tons, whereas the Soviet Union must carry this out in two years.

But the matter does not rest with an enormous growth in traffic. Not less important is the fact that the Soviet construction plan creates an entirely new geography, the distribution of the productive strength of U.S.S.R. economy, and distributes the geographical destination of goods traffic in an entirely new manner.

The last few years and the coming year show and will show the great amount of goods traffic in districts very little inhabited, in districts which have the poorest of transport facilities, and in desert places, uninhabited, where social construction is the pioneer of some kind of culture.

The Ural-Kuznetsk Combine, Karaganda and Halilovo with enormous deposits of iron and coal, the unscratched wealth of Kazakstan, the problem of joining up great Asiatic stretches between themselves, the problem of northern and southern exits from the Asiatic regions of the Union to the European region, the problem of northern timber forests, the cultivation of vast lands for Sovhos and Kolhos—in a word the reconstruction of one-sixth of the entire world from the grip of landlords, old style capitalism to the most forward country of the world—requires new transport arteries, and in the first place enormous railway construction in backward districts, formerly entirely deserted.

The program for further changes in the technical base of the railway traffic is electrification. Avoiding all these steps in development of capitalist technique, which has been used in other countries, the Soviet Union turns to the latest and most important achievement of capital transport. The electrification of railways which is difficult of accomplishment in other countries, is possible in a country where there are no capital brakes. In this direction the U.S.S.R. will in the shortest possible time, pass the transport of the most important countries.

America, England, Germany and France have a very small percentage of electric railways—the U.S.A. 3,835 kilometers (0.9 per cent), England 743 kilometers (2.3 per cent), Germany 1.550 kilometers (2.9 per cent) and France 1,197 kilometers (2.8 per cent).

It must also be further kept in mind that the construction of powerful central stations permits of the usage of cheap fuel to the maximum degree, and of these the U.S.S.R. has many (turf, slakes, coal dust, low kinds of coal, etc.). This still further raises the economic effectiveness of electric stations, while the construction of hydro-electric central stations permits the use of free energy.

Besides the considerable economy in fuel, the electrification of transport gives no less economy in other elements of expenditure.

According to the data of the electric railway Baku-Sibunchi, the staff of servants on the electrification of this line was considerably reduced. On January 1, 1927, with steam motive power, there were 284 men, but on January 1, 1930, with electric motive power, there were only 117 men. This reduction of 60 per cent in the staff was reached with an increase of 52 per cent in passengers.

Great economy is also made in the cost of construction. In electric motive power the necessity of soil work is almost done away with, as regards the profile of the track, as electricity is capable of going up any rise, there is no need for water supply which generally runs into 3-5 per cent of the cost of construction of the line, there is no need to build coal yards, naphtha reservoirs, etc. Thanks to the small dynamic action on the line by an electric motor, there is no need to reconstruct the surface of the track when electrification is introduced. This gives an economy of 100 tons of metal for each kilometer of line.

All this gives a colossal advantage to electric motive power, without mentioning the fact, that electric motive power alters the conditions of work of the train staff, as well as station, making them much more hygienic.

During the next few years 3,690 kilometers of electrified lines will be put into operation, which means that the U.S.S.R. will in two years electrify nearly 2½ times more track than the U.S.A. has done in the last ten years.

At the same time as electrifying several thousand kilometers of railway track, the U.S.S.R. is constructing powerful locomotives for non-electrified lines, and will introduce into transport such elements of reconstruction as auto couplings, auto blocks, etc.

Big Iron Concession to Japanese

The Singapore *Japanese News* publishes the following Kobe message.

In the midst of steadily diminishing mining claims held by the Japanese in the Malay Archipelago, much is expected of the iron deposits, acquired recently by the Tochigi Shoji Kaisha of this city, on the upper forks of the Muar River, emptying into the Johore Straits. These deposits, which are estimated to run into tens of millions of tons, are said to be remarkably rich in the percentage of minable iron, containing as much as 65 per cent. The Tochigi Shoji, the claimants, were enfranchised by the F.M.S. authorities on August 3.

The Tochigi Shoji plans to embark on an extensive development program in the South Sea islands, with their own cargo ships, and the iron ores to be mined will be brought to Japan and supplied to the Government iron mills at Yawata and elsewhere.

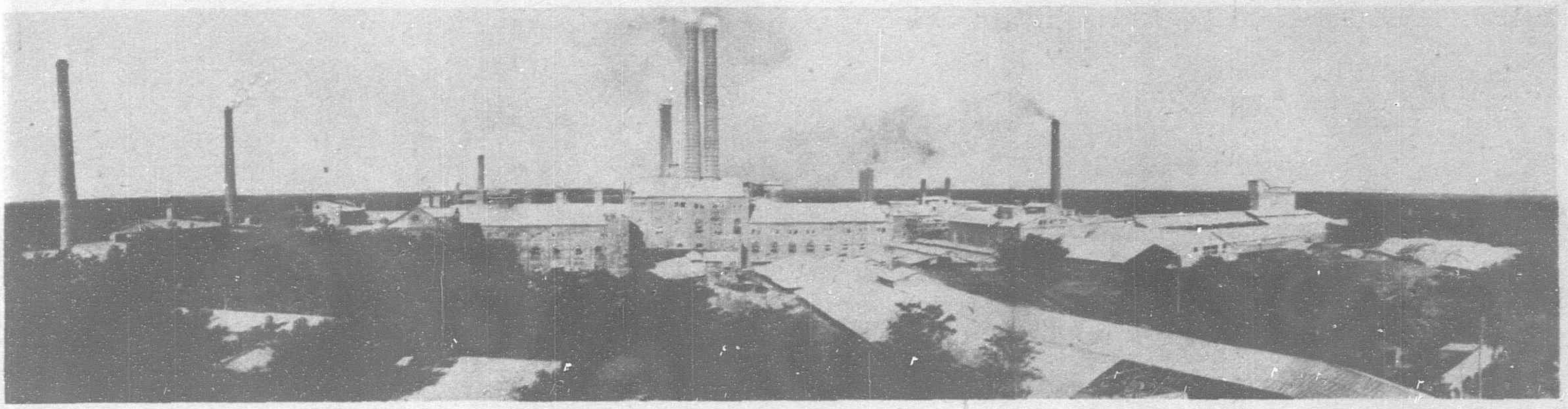
The Tochigi Shoji Kaisha, with headquarters at Wakamatsu, Fukuoka Prefecture, are shipowners, mineowners, shipbuilders, importers and exporters combined. President Tochigi, accompanied by several mining engineers and office executives, is expected to sail for Johore shortly.

Magnitostroy Operating

After overcoming many difficulties including the lack of skilled labor, the metal trust has assumed control over the Magnitostroy, Soviet Russia's new industrial center in the Ural Mountains.

Referred to by the Soviet Dictator Stalin as "the hope of the entire Soviet industry," the new center represents the latest word in the metallugrical industry. There are the most modern blast furnaces, rolling mills equipped with the latest machinery, and a giant power plant, developing 48,000 kilowatt, all imported from the United States, at a total cost of 20,000,000 gold dollars. All this is now said to be going at full blast, after all available experts and skilled metal workers throughout Russia have been concentrated in the Urals. Even so, the situation appears to cause some uneasiness, as appears from a broadcast speech of the general manager of the metal trust, Demkin, who admitted that there were some misgivings whether the output of the new center would justify the enormous cost.

The press, on the other hand, unreservedly welcomes the completion of Magnitostroy. *Pravda* recalls a recent speech by the Commissary of War, Vorochilev, emphasizing that not only the Russian metal trust, but also the Red Army had set great hopes upon the new mills which were to make the army independent of foreign supplies. In this connection the papers dwell extensively on the discovery of vast nickel ore deposits along the middle reaches of the Volga. These deposits are said to be so great that they will not only enable Russia to dispense with nickel imports, but even to export the metal.—*Transocean-Kuo Min.*

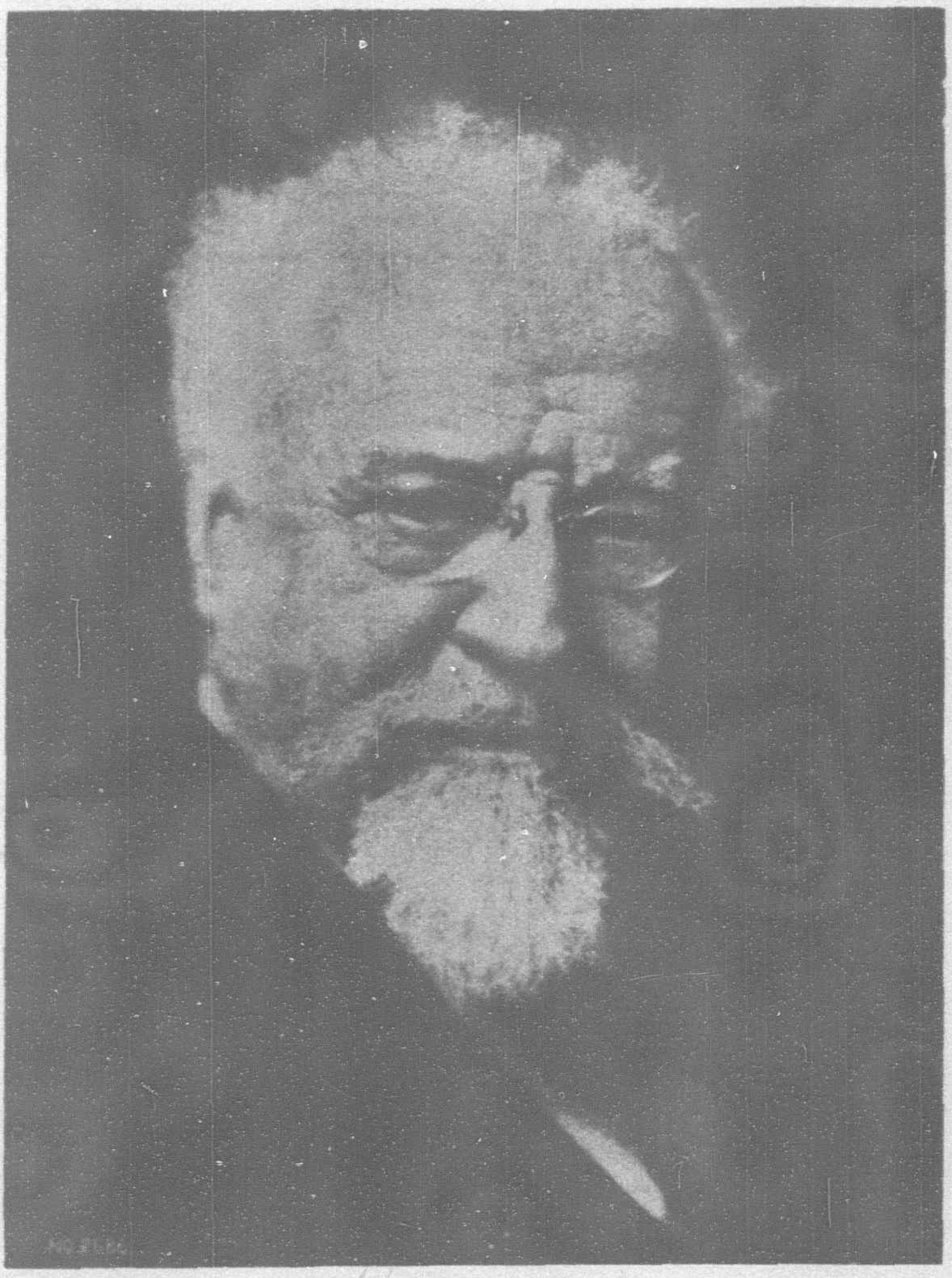


Chee Hsin Cement Co., Ltd., Tangshan Works

F. L. Smidth & Company A/S Has Fiftieth Anniversary

EVERYBODY connected with the cement industry in the Far East will probably know the Danish firm F. L. Smidth & Co., which is specializing in the cement industry as engineers and manufacturers of cement making machinery.

This firm, which has its head office in Copenhagen, was started fifty years ago, and so celebrated its fiftieth anniversary on January 2. The firm has during this half century developed from a modest beginning to its present standing as a firm with widespread interests and a worldwide reputation.



Dr. Poul Larsen

The founder of the firm was a Danish engineer, Mr. F. L. Smidth, who soon after the start took as partners two other engineers Mr. Poul Larsen, and Mr. Alexander Foss. The firm was started as a consulting engineering firm, specializing in brick works, but later they also went in for cement plants and so in 1888 the first cement plants were built according to the firm's plans, in Denmark and Sweden. Soon after this the manufacture of cement making machinery was taken up, and at the same time the firm's activities were extended to countries outside Scandinavia. An office was opened up in London in 1890, in Paris and St. Petersburg (now Leningrad) in 1893 and in 1895 a branch was established in New York.

From the very beginning all the work abroad was done by the partners of the firm,—all of them engineers,—or by engineers of their staff, and since then all the firm's activities, all the leading actions of the Company, technical and commercial, have been directed by highly trained engineers.

One of the first cement works designed by the firm was partly founded by them, and, therefore, a first-hand knowledge of all the difficult technique of cement-making was learnt at these works.

Since then the firm has had the very best opportunities to acquire experience from the plants erected by them under the most varying conditions, in cold climates, in temperate climates, and in the tropics, but always they had the factories in which they were financially interested to fall back upon for experiments and first-hand knowledge of what could be done and what should not be attempted.

The problem of cement-making is so varied that a large staff of chemical, mechanical, electrical, and constructional engineers must be at the disposal of the firm for the purpose of examining materials, designing machinery and the power plant to drive it and the buildings to house it.

One of the things which secured the success of the firm was the invention of the tube mill which was brought on the market by the firm in 1893. This tube mill was only a small one (2-ft. in diameter and 13-ft. long), and its power consumption was only 6 h.p. Since then the tube mill has been developed into a huge type of mill, the largest of which are driven by 1,000 h.p. electric motors. Further the firm developed the rotary kiln, which is an American invention. How big a development has taken place in this respect will be gathered from the fact that the first rotary kiln made was only fifty feet long and had a capacity of only 30 tons per day, while the present kilns are made in sizes up to 500 feet long, and have outputs of about 3,000 barrels per day.

Of other achievements during the years may be mentioned the invention of a special process for wet grinding of stoney raw materials; further the development of new types of transporting machinery and machinery for automatic packing and weighing of cement.

It is, as will be understood, chiefly in the cement industry that the firm has specialized, but also in kindred industries, such as mining and metallurgical industries the firm's mills and kilns are used with the greatest success.

At the time of their fiftieth anniversary they stand well established with a central organization in Copenhagen with a technical and clerical staff of more than 500 people there, with a large branch in New York and branches in Australia, China, England, France, Germany, Italy and Japan.

In spite of all theories of rationalization the firm has not found the time ripe yet for a centralized place of manufacture of their plant. There are national prejudices and customs barriers everywhere, and consequently the firm has established its own engineering works in three different countries: Denmark, Germany and U.S.A., while they have permanent arrangements for the manufacture of their machinery in eight countries in Europe and in Japan and Australia.

In order to follow more closely the developments in the various countries, technically and otherwise, they have increased their financial interest in cement works, and they stand to-day as the principal shareholders in thirteen cement works in Denmark, England, Egypt, Esthonia, Germany, Norway and Portugal. These works have a capacity of altogether 9,000,000 barrels per annum.

The firm also controls various lime works and brick yards. They control factories for making insulating bricks, asbestos cement works, and works for manufacturing paper bags used in the cement industry.

They have controlling interests in constructional engineering companies and factories producing ready-made concrete.

They have their own financial company in Denmark, the Dansmidth Trust Company, and they have interests in various trading companies connected with the cement and allied industries.

Of the original leaders of the firm, F. L. Smidth died in 1899 and Alexander Foss in 1925.

The third partner, Dr. Poul Larsen, is chairman of all the companies and undertakings and is acting managing director of F. L. Smidth and Co., which controls the whole huge concern.

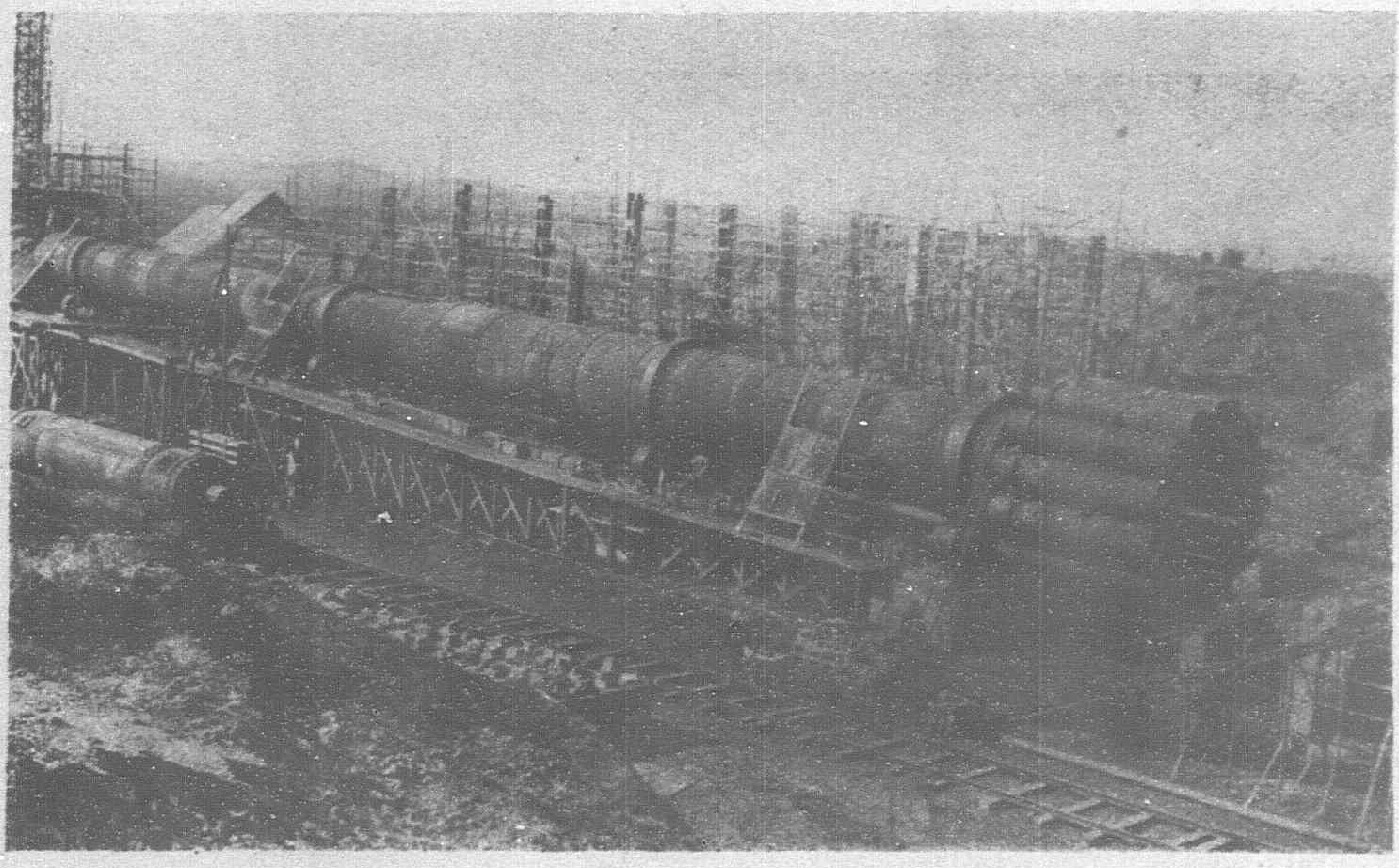
F. L. Smidth and Co. was originally a private firm, but is now a private limited company.

Dr. Poul Larsen was one of the vice-presidents of the World Engineering Congress in Tokyo in 1929 and is, therefore, well known to leading men inside the industry in the Far East.

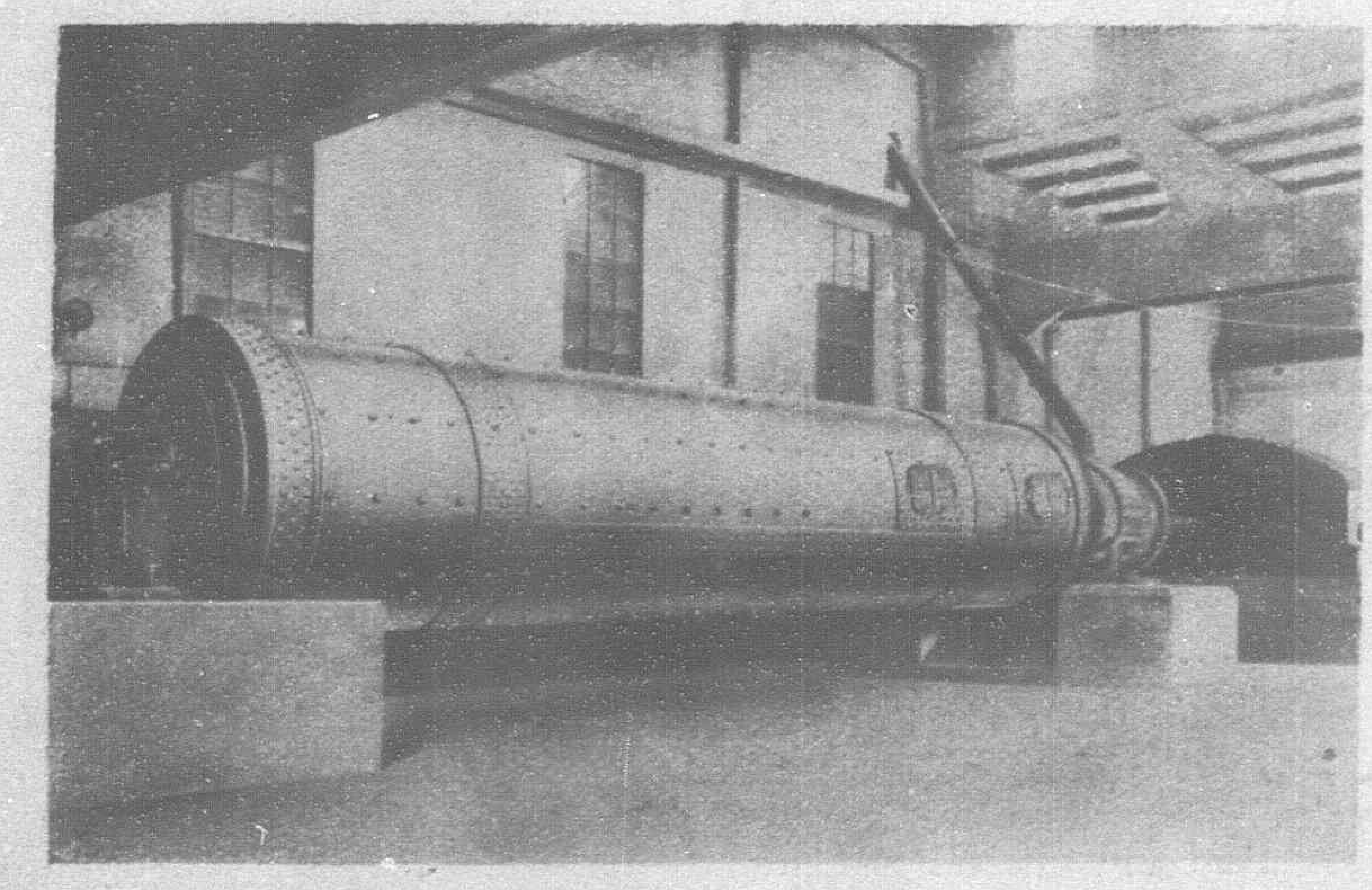
As to the firm's activities in the Far East, it may be mentioned that it has offices in Shanghai, Peiping and Tokyo, and during the past years has done considerable business.

(Continued on page 43).

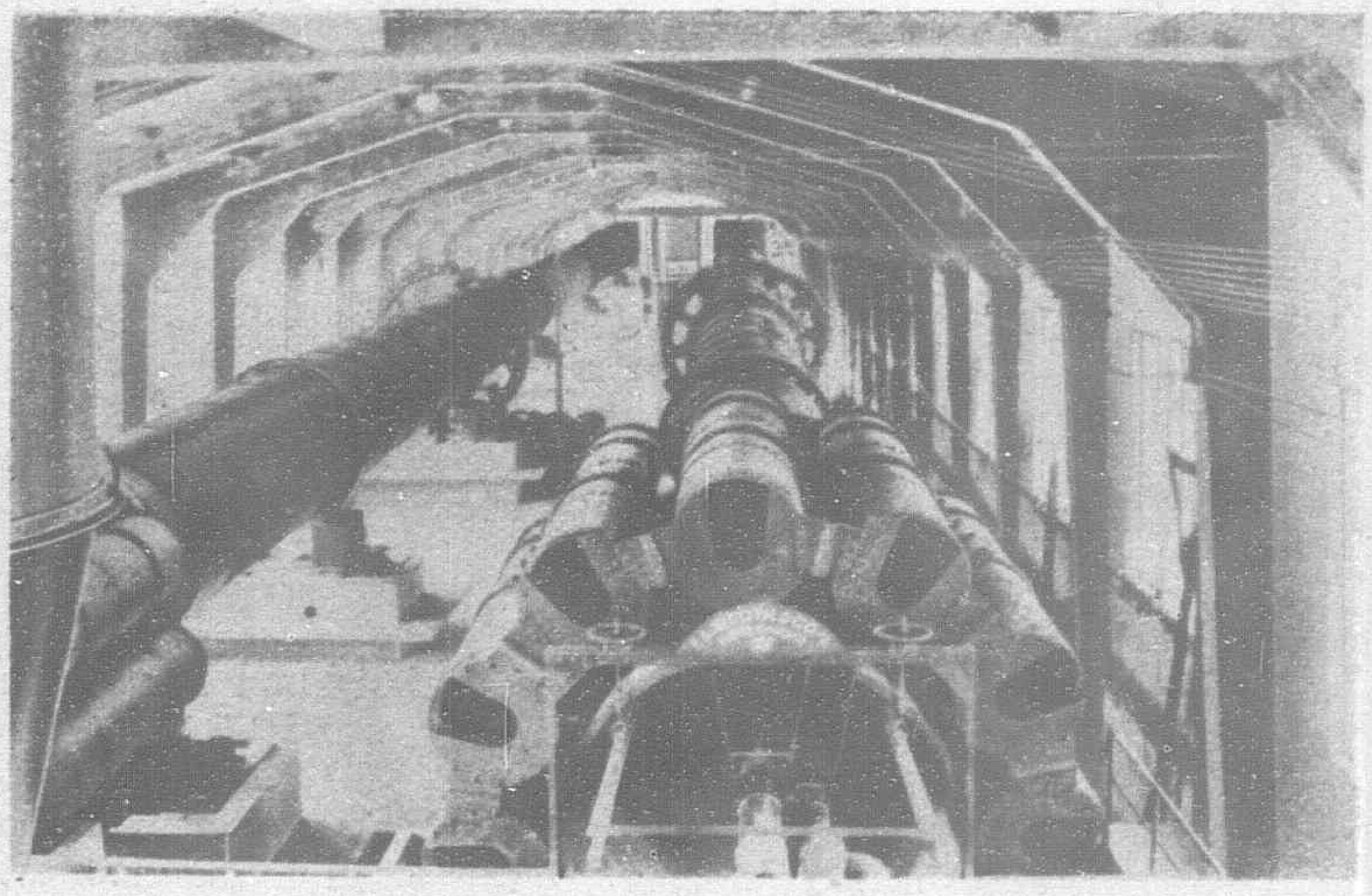
The Asano Nishitama Works



The Kwangtung Provincial Government's Cement Works under construction



The Unidan Mill

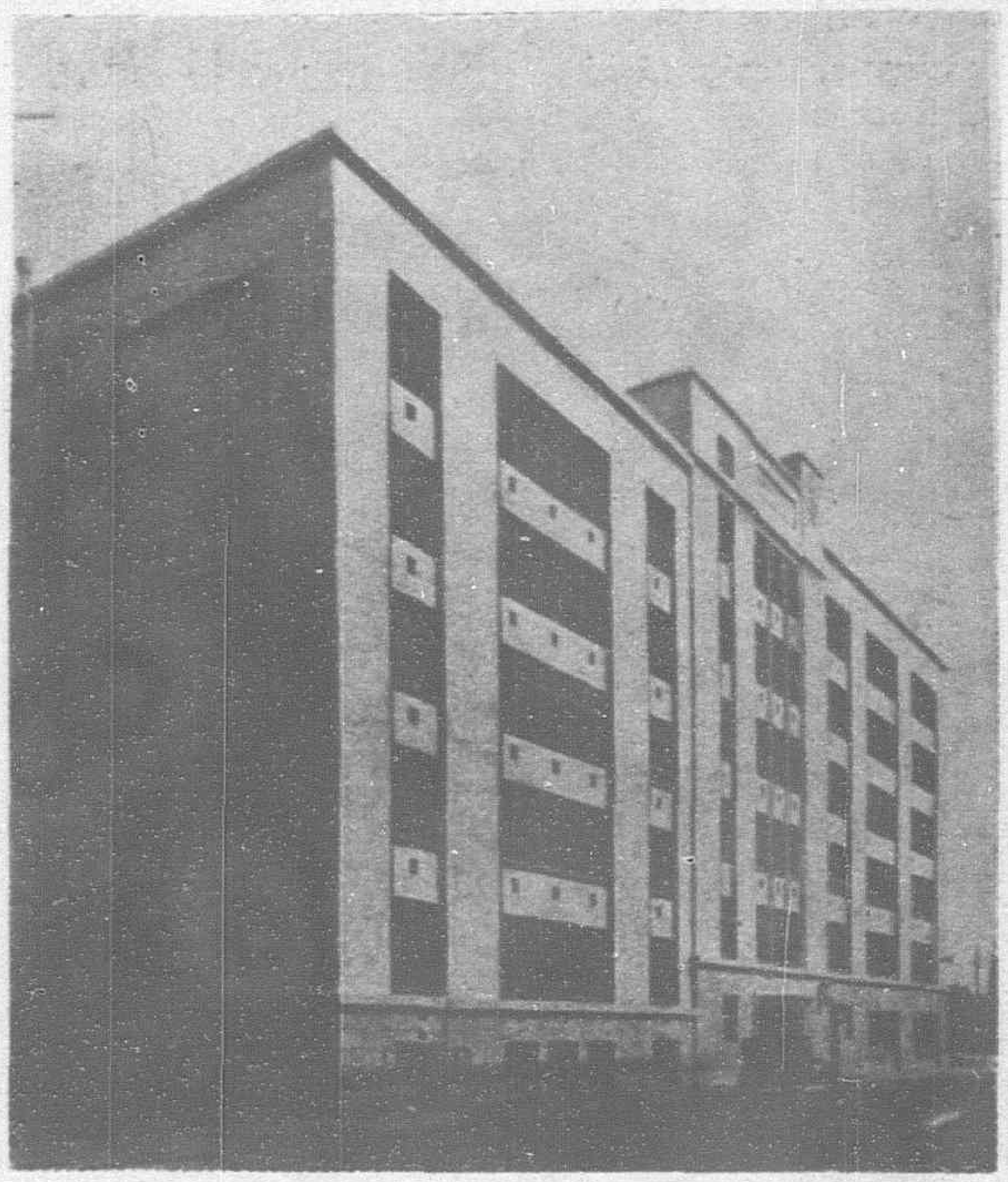


The Unax Kiln

The Reconstruction of Tokyo and Aesthetic Problems of Architecture

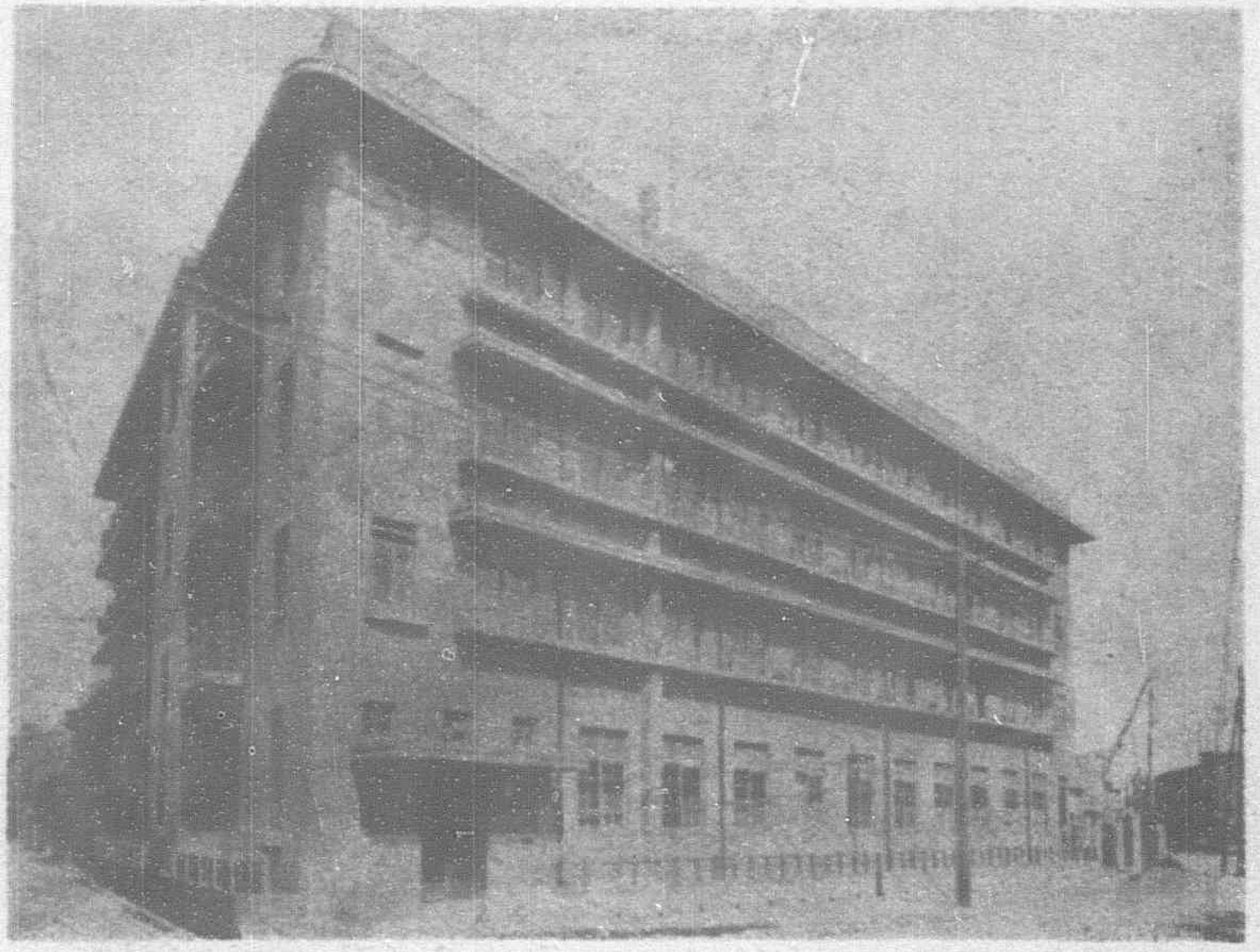
By INO DAN, Assistant Professor, Tokyo Imperial University

The dynamic change of the earth's crust that took place suddenly at 11.58 a.m. on September 1, 1923—the fateful day which Japanese people cannot forget—plunged into death and destruction the Capital of the Empire, Yokohama, Kanagawa, other cities and towns facing Tokyo Bay and all the villages existent on the plains north of the Hakone mountain range. The citizens of the devastated capital who were made homeless by this catastrophe wandered about on constantly rocking earth, sleeping in the streets, and watching the flaming smoke of the conflagration which lasted for three days and nights. They were dumbfounded and had no tear to shed in the face of the astounding destructive power of Nature. They were possessed with such consternation as one might feel at the destruction at the end of the world. Great multitudes of people, pale and ghastly, fled hither and thither in silence, driven by the flames.



Marunouchi Garage, iron framed concrete, Designed by Mitsubishi & Company, 1929

A Roman writer, Pliny, wrote of the destruction of Pompeii, but the Pompeii of those days was hardly more than a mere spa of Rome with a population of only a few scores of thousands. Tokyo, one of the greatest metropolises of the world with a population of nearly four millions in and out of the city, was swept by this unheard-of destruction. How could this great multitude of people escape from this terrific havoc, conflagration and cyclone which occurred without a moment's warning, and how could they possibly avoid starvation in the devastated area of the city where the means of traffic and communication were temporarily cut off? Before we calculate what an enormous amount of property was lost in the catastrophe, it is necessary for us to think of this vast multitude of people struggling through trials and tribulations in the midst of the horrible disaster. Among the people who took refuge in Ueno Park under the showers of flying sparks from the burning city on that fatal night, were born eighty infants!



Charity Hotel, Shitaya-ku, Tokyo, iron framed concrete, Designed by Bureau of Engineering, Tokyo, 1928

I leaned on the trembling earth that night and thought that the only literary effort which could adequately reflect this frightful scene of horror, is the following passage from the Revelation of St. John:

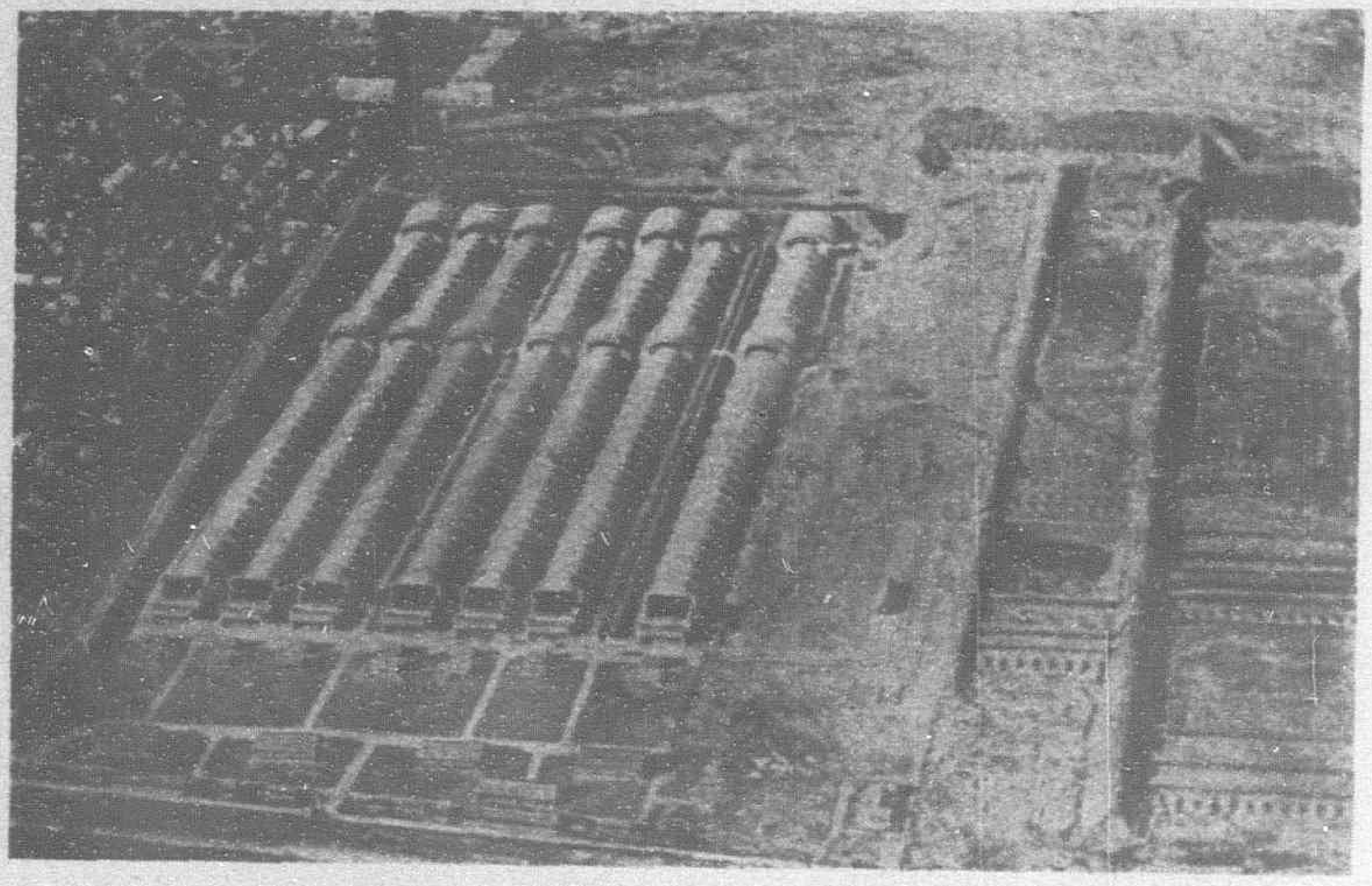
> The Sun became black as sackcloth of hair,
> And the whole moon became as blood;
> And the stars of the heaven fell unto the earth,
> As a fig tree casteth her unripe figs
> When she is shaken of a great wind.
> And the heaven was removed as a scroll when it is rolled up;
> And every mountain and island were moved out of their places.

The solution of various problems following the great earthquake and fire has for its basis the actual experience through which the people went during the time of calamity. The Japanese people were deeply impressed with the scene of the desperate situation which was never to be forgotten. What was more, they heard the spirits of their lost parents, brothers, wives, children and friends whispering in their ears. They believed that the adoption of methods to prevent the coming generation from suffering this sort of misfortune again, was the best way to comfort the spirits of the victims. With this humanitarian motive firmly fixed in their minds, they went about the task of rebuilding the capital.

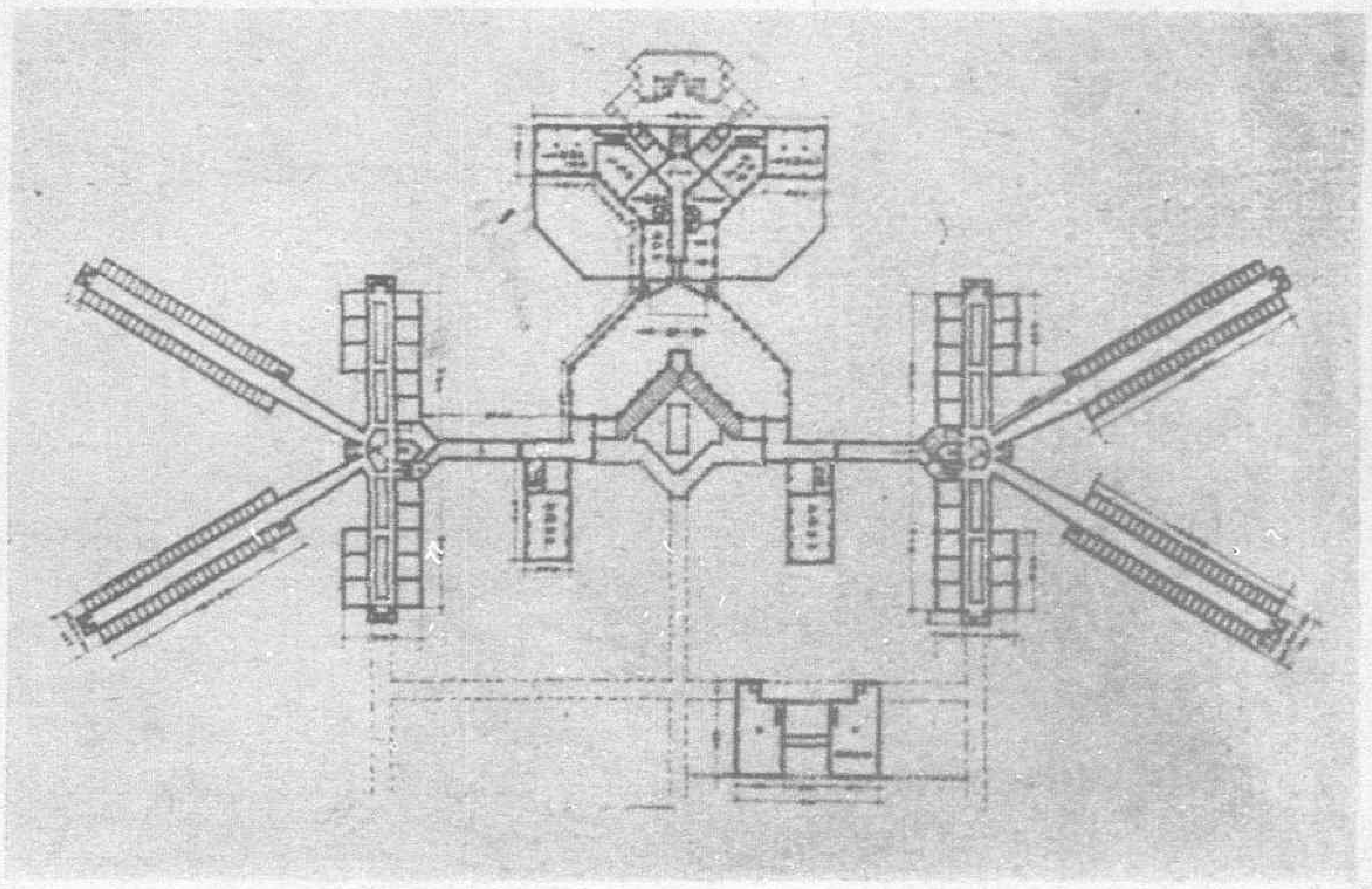
The Reconstruction Bureau was established by an Imperial ordinance immediately after the earthquake and fire, with Count Shimpei Goto as its president. In the course of the subsequent eight years, an enormous sum of money, totaling Y.820,000,000, was spent for the reconstruction of Tokyo and Yokohama. The nation at large, however, was willing to shoulder this enormous burden because of the fear that otherwise the calamity might be repeated. In the reconstruction of the capital undertaken through such a motive, it was simply inevitable that consideration of the aesthetic should be totally ignored. The citizens of Tokyo and Yokohama were unable to think seriously of the aesthetic aspect of the new buildings which they were going to erect when their minds were fully preoccupied with the thought of their durability and convenience. "The most solid building with the least expense" was the principal object of the Reconstruction Bureau as well as of the people for the reconstruction of the capital. But was this policy wise?

The City of Tokyo has no restriction on the style of architecture except for sundry regulations concerning the height, light, area, gradient of staircases, dynamic calculations and the like. As a result, the Tokyo of to-day has become a sort of architectural exhibition with a confusion of all sorts and varieties of buildings. This is not only confined to temporary buildings permitted to stand for a period of ten years since they were erected following the outbreak of the holocaust, but it is true of permanent buildings. We do not consider it necessary for a city to have its buildings conform to one kind of architectural style or another as is the case with the buildings of Paris. In a sense it is very inconvenient to have the architectural style fixed when we realize that taste in style constantly changes with the progress of time. It is also quite natural that changes in the mode of living and in the materials available are bound to have some effect upon style. In the light of this fact, it is highly problematical whether any decision on style can possibly be made with advantage in this world of constant progress.

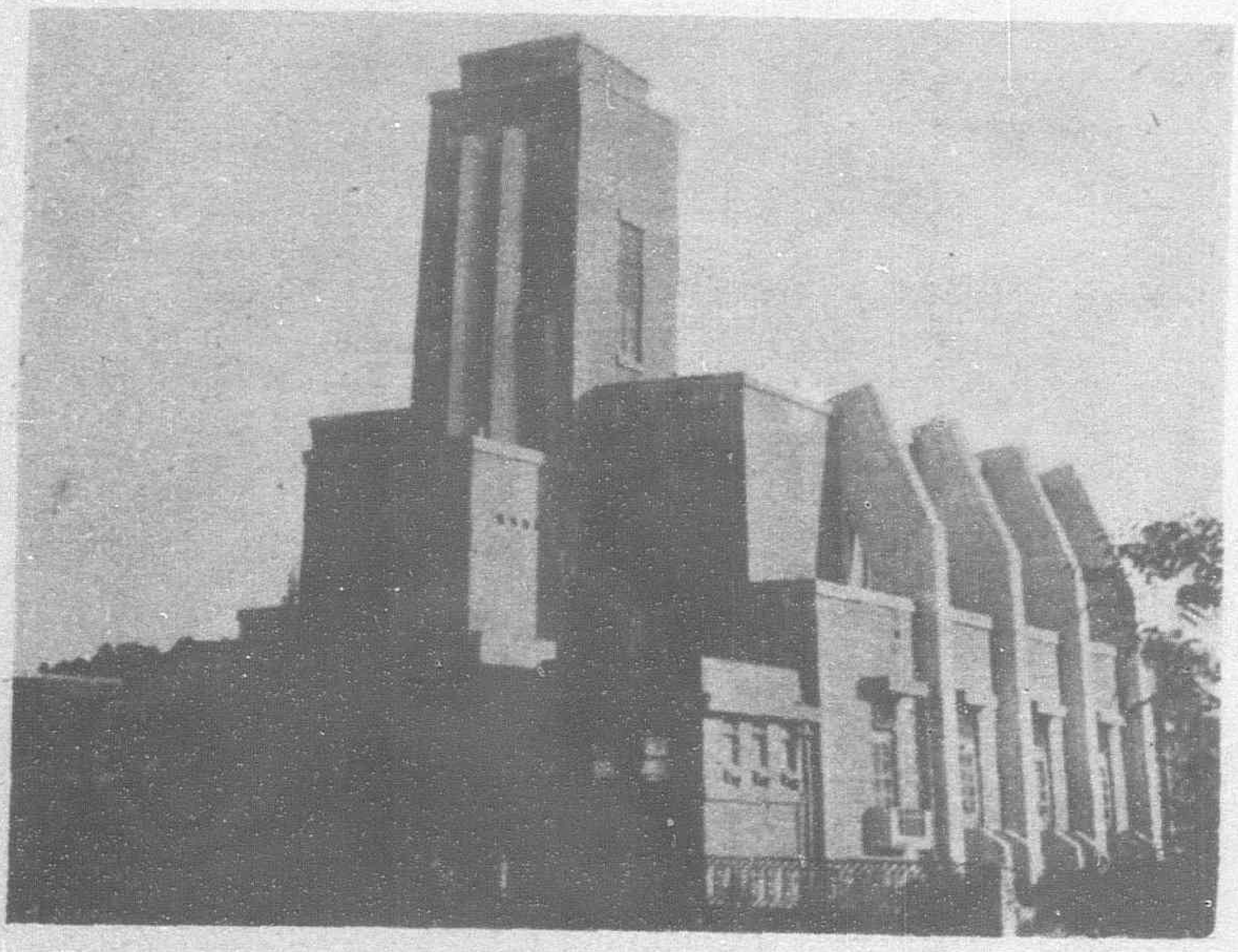
But a consideration of architectural style need not necessarily be regarded as always a matter concerned purely with the aesthetic.



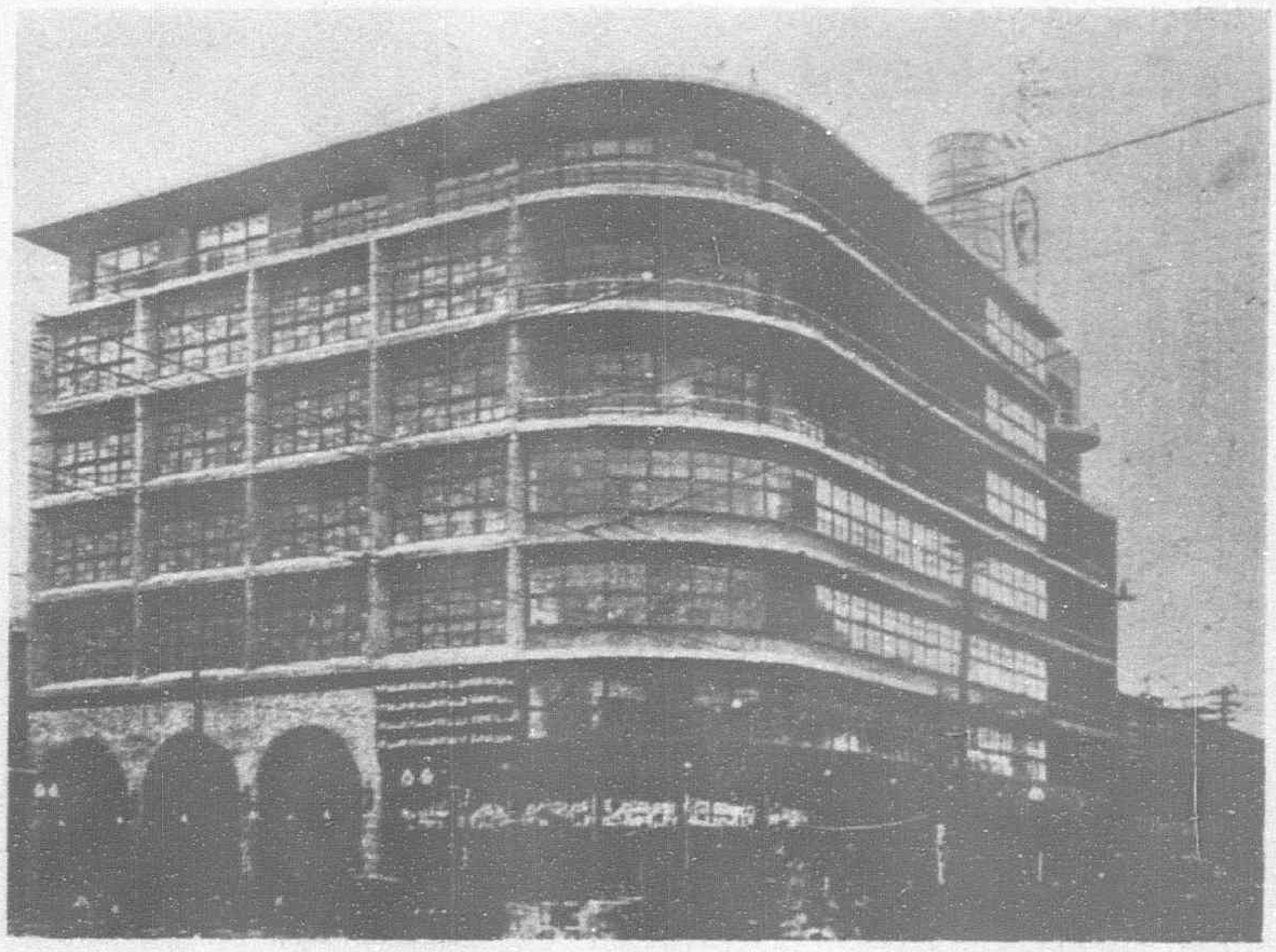
1 Rifle Range, Okubo, Tokyo, iron reinforced concrete, Designed by Engineering Bureau of Imperial Guards



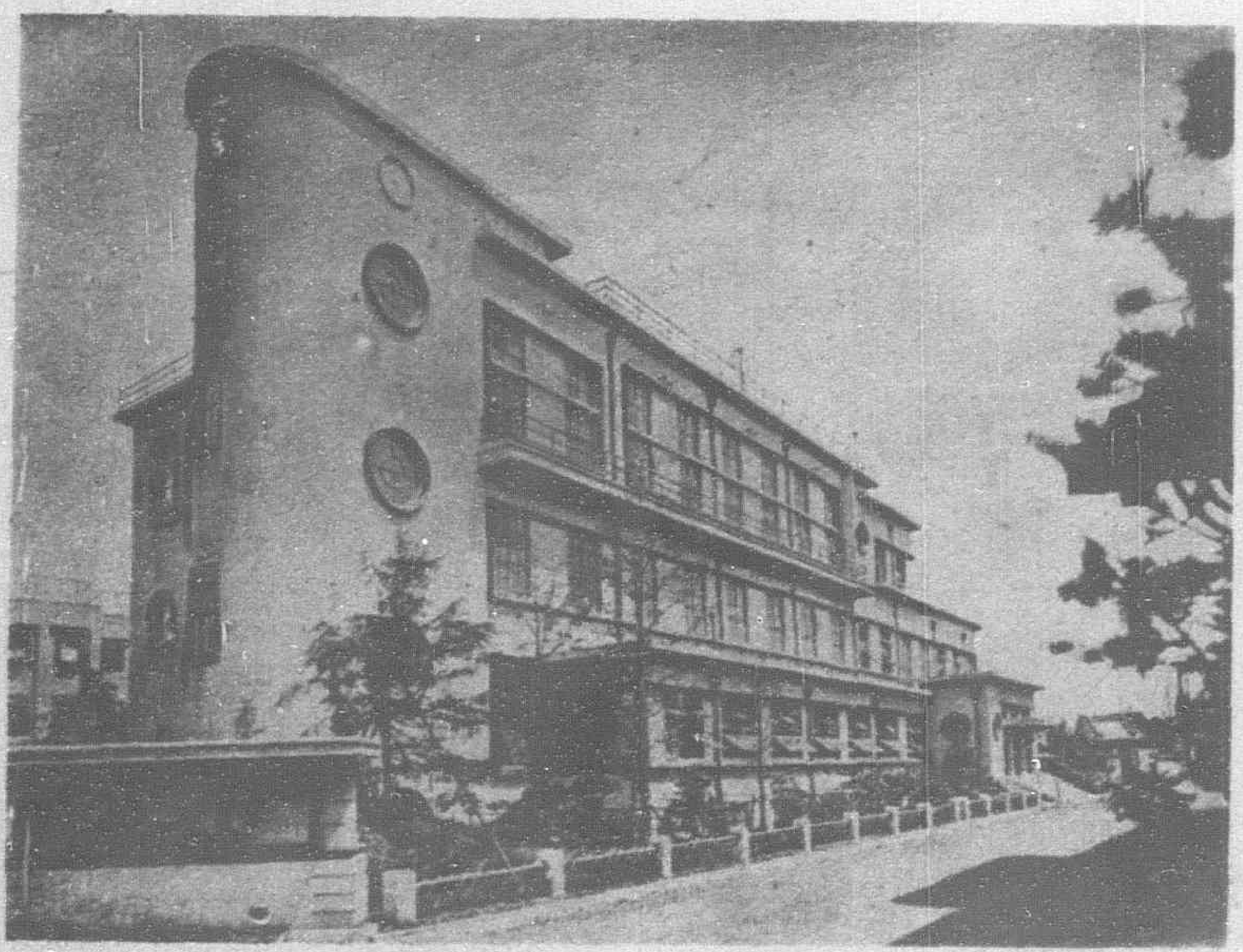
2 Plan of Kosuge Jail, Kosuge, Tokyo, Designed by Construction Bureau Judicial Department, 1930



3 Chapel of Yokuhuen, Home for Old Men, Takaido, Tokyo, Designed by Prof. Shozo Uchida and Tatsujin Toki, 1925

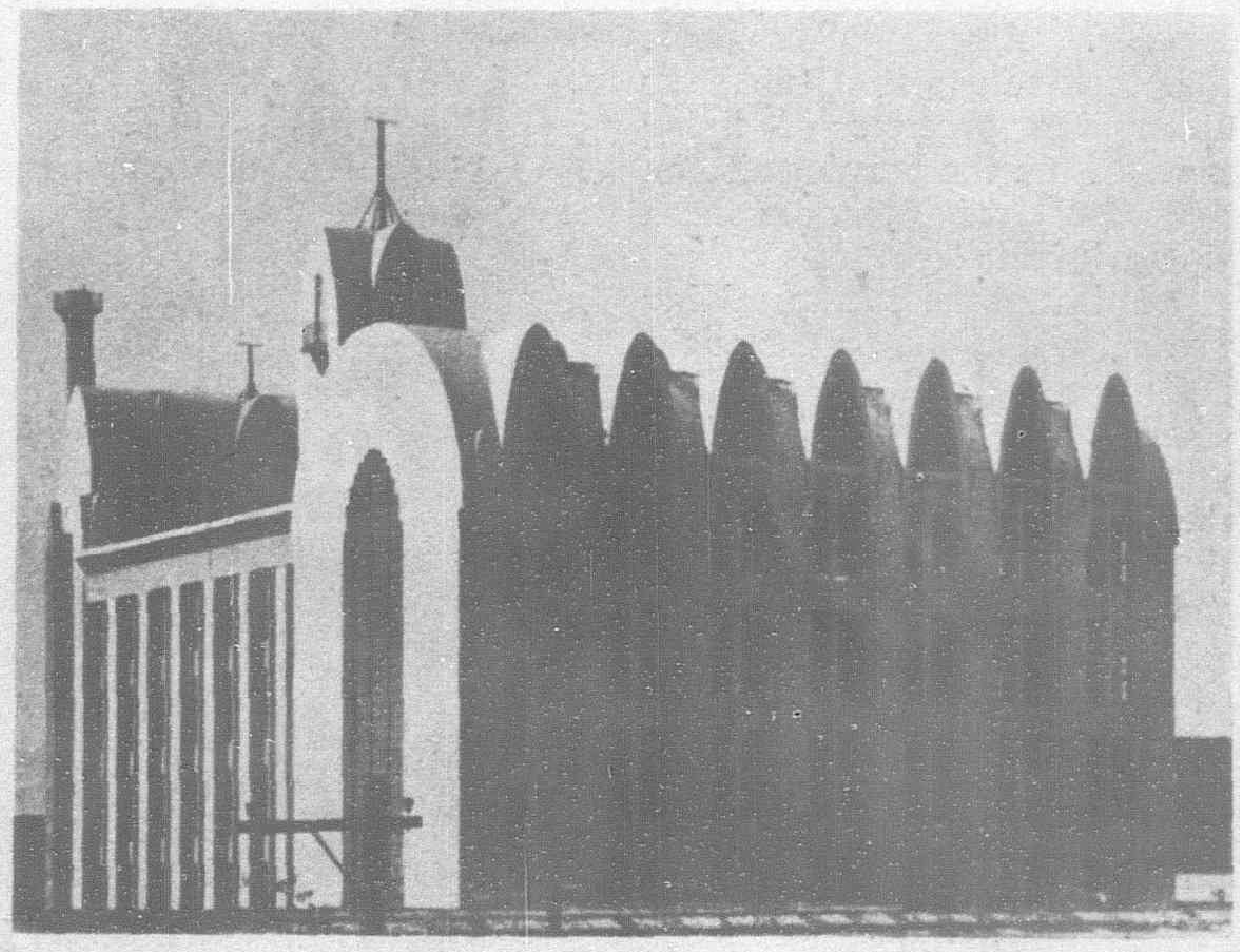


4 Shirokiya Department Store, Nihonbashi, Tokyo Designed by Kikuji Ishimoto, 1928



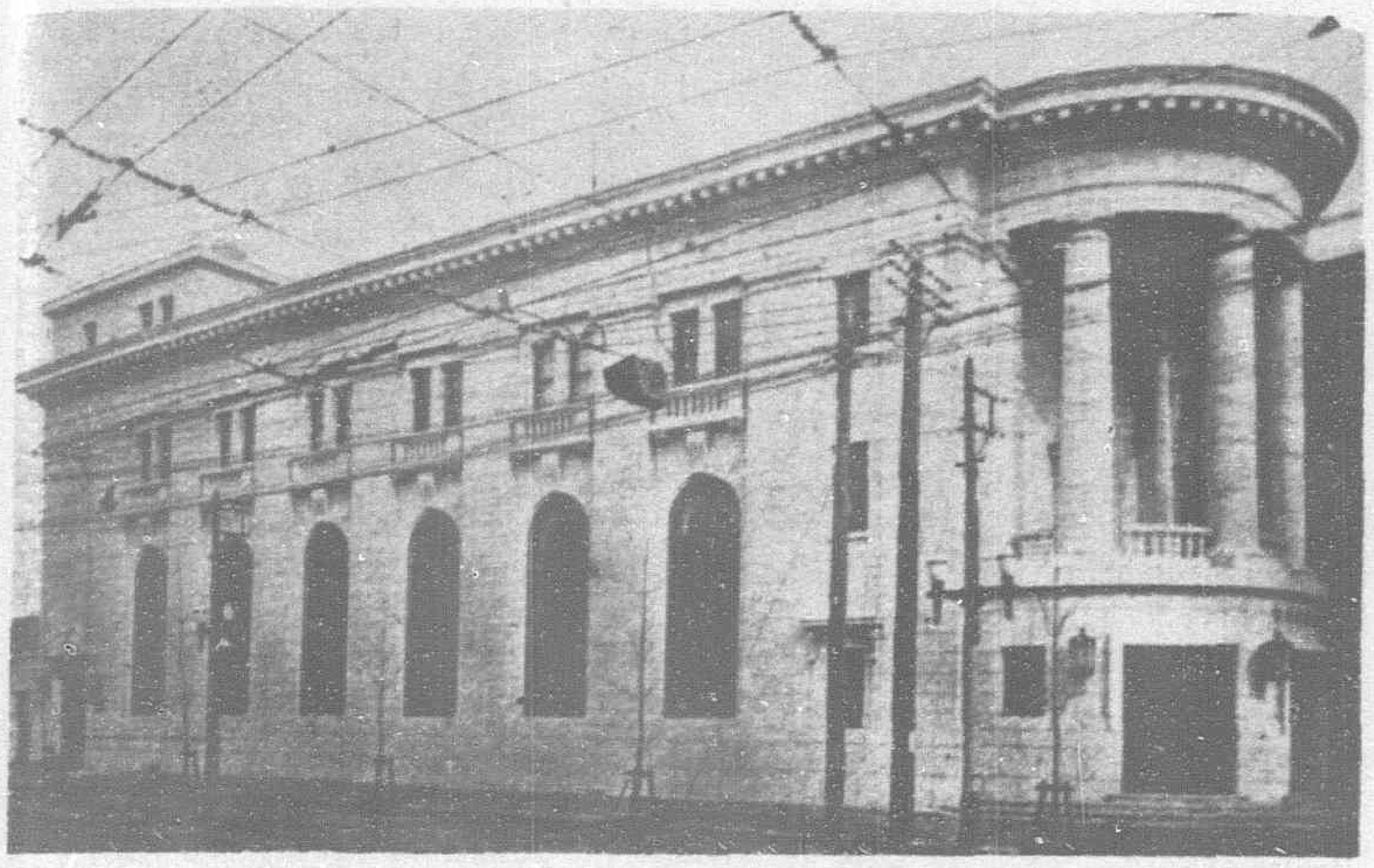
Ward Office of Shitaya, Shitaya-ku, Tokyo, Designed by Engineering Bureau of Tokyo, 1930

5



Central Telegraph Office, Marunouchi, Tokyo, Designed by Engineering Bureau of the Communications Department, 1924

6



Yokohama Branch of The First Bank, Yokohama, Designed by Shimizu & Co., 1929

1

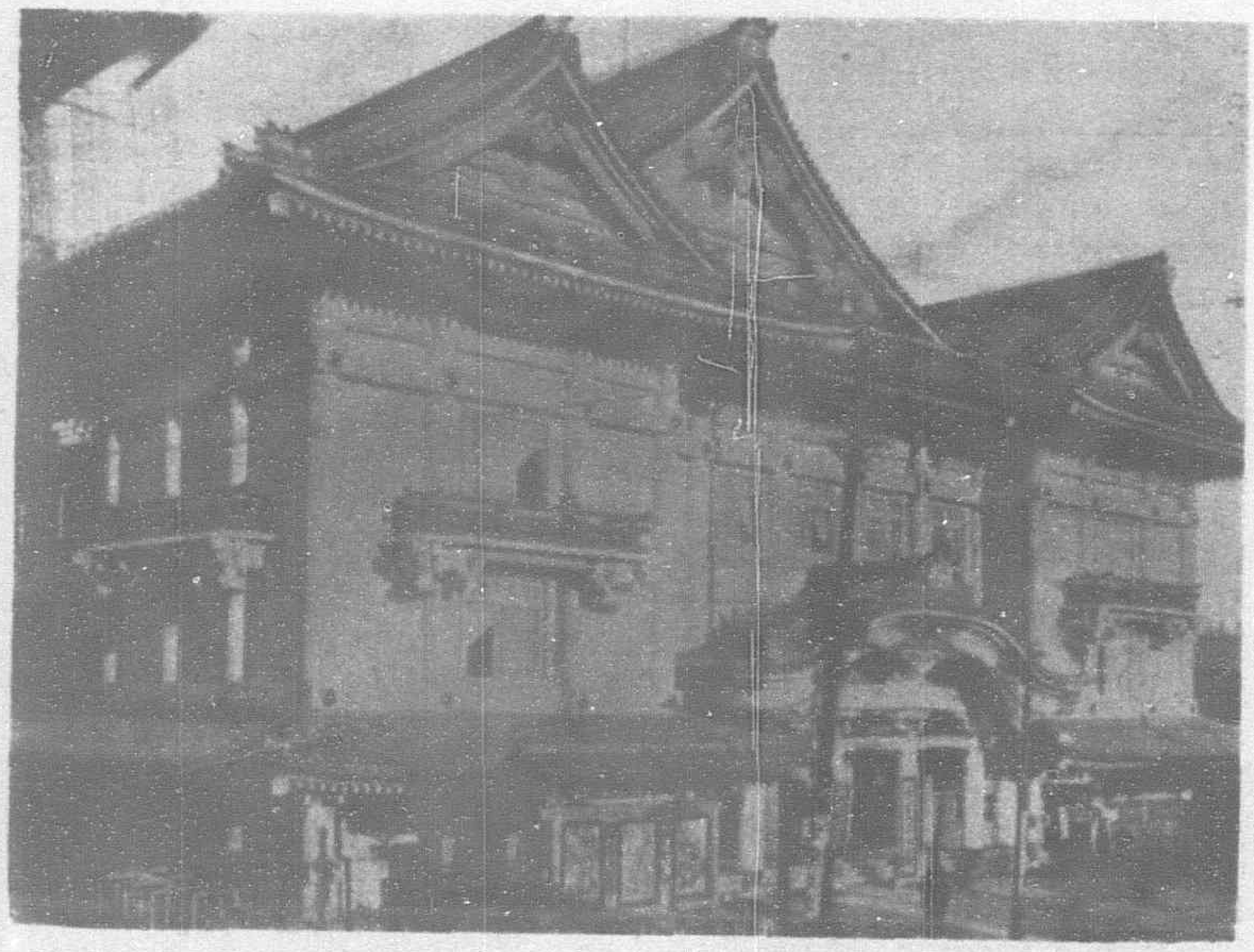
Library of Imperial University, Hongo, Tokyo, Designed by Prof. Shozo Uchida and Prof. Hideto Kishida, 1928.

2

It must not be forgotten that architectural style has commercial value as an advertisement. This commercial value of architectural style is appropriated to good advantage not only by the person who has the building erected but by the architect as well. The fact that absolute freedom in the choice of style has permitted a combination of style with commercialism must be regarded as a failure on the part of the Tokyo Municipality. In other words, the absolute non-restriction of architectural style has encouraged the combination of style with commercialism. If some partial restrictions such as those regarding the color of walls and the division of the walls of a building, which constitute a part of architectural style, had been placed on buildings in the city, architectural structures would have assumed a common nature as city buildings even though any fixed style were not enforced on all buildings. It is not impossible in the future to control ugly things such as huge signboards from a consideration of public morality or by some legal measure, since most of the buildings so far erected in the city are temporary structures. But in the case of permanent buildings, it has become positively impossible to unify them in the future.

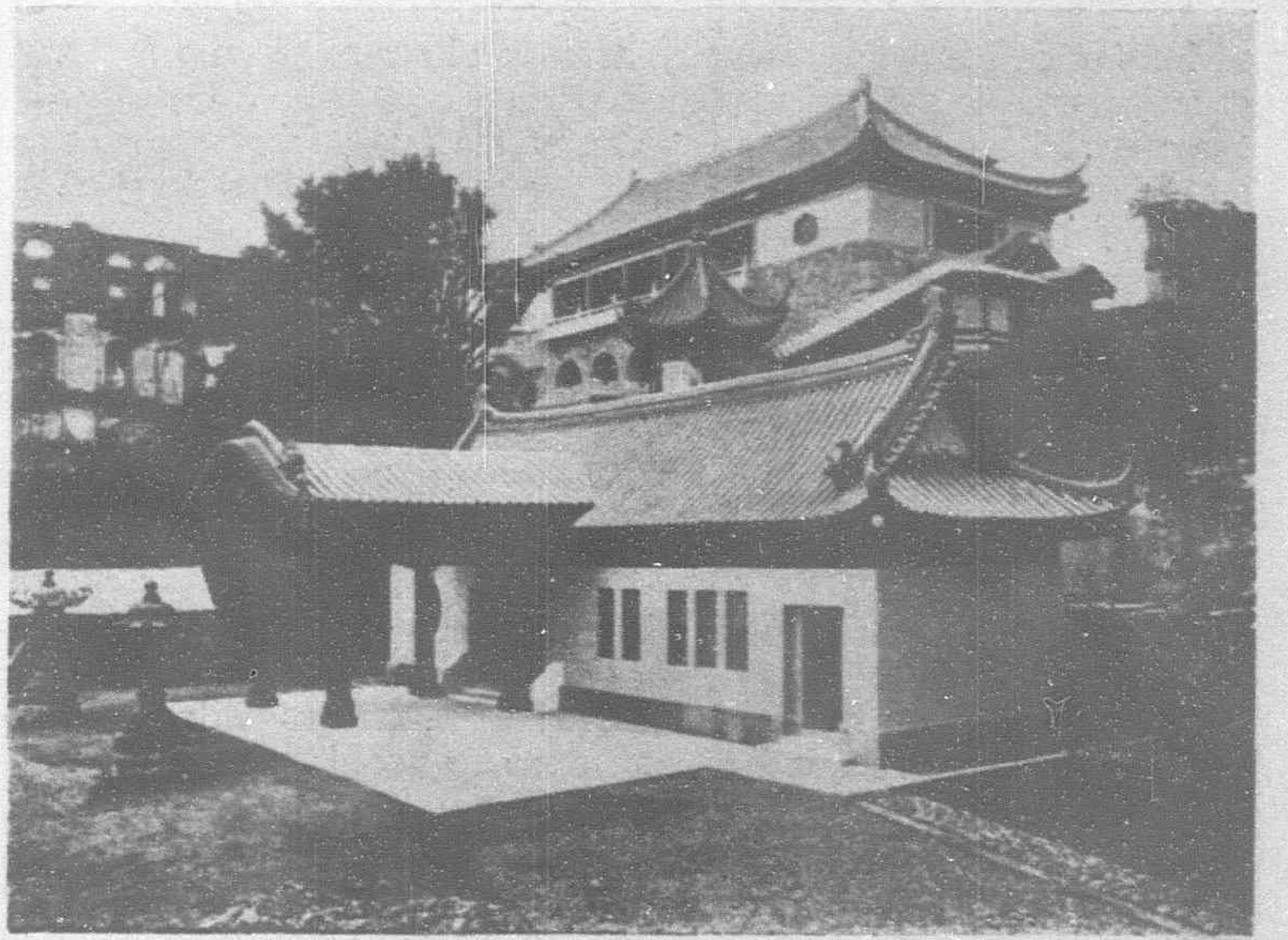
Thus in the course of eight years, the reconstruction of Tokyo which was started with an enthusiasm animated by the humanitarian motive, has gradually forgotten its original purpose. The enthusiasm might have lasted but many circumstances of practical interest which could hardly be surmounted by this enthusiasm cropped up one after another in the course of time. Immediately following the catastrophe, the city was confronted with the serious problem of providing the people with dwelling houses. The people who took refuge in the homes of their friends and relatives in other cities could not stay under their protection for long. From the fact that the population of Tokyo has not yet attained its former size, it is plain that a fairly large number of people have already settled down and secured work in other cities, but the majority of them came back to their old places. Because of the difficulty of announcing exact details concerning the road construction plan, the city had to permit people to erect their temporary buildings on the sites of their former houses for a period of five years pending the erection of permanent buildings according to the building regulations with particular reference to fire-proof construction. The period of five years was extended to ten on account of the unfavorable economic rehabilitation of the people. The fact that the reconstruction of the capital had to be started with the erection of temporary buildings in this manner has caused no small complication in the execution of the city planning.

The reconstruction of the city on the basis of the principle "The most solid structure with the least possible expense" provoked many different architectural views as difficult circumstances cropped up in all aspects of the city reconstruction, and they were put into practice. However thoroughly this principle was put into effect, one cannot deny the presence of a style of one kind or another in a structure although it may not likely be a historic style. Here the aesthetic problem begins to assert itself. When a structure becomes an object of view, it cannot be denied that the shape, whether it be square, tubular or any of the other elemental shapes, gives some kind of impression. At this point, a subjective criticism of value such as "beauty" and "pleasure" is voiced about the style of architecture. When the realistic principle for the erection of buildings began to come in contact with this aesthetic consideration, the situation gave rise to complicated theoretical conflicts regarding the aesthetic claims of architectural production.



Kabukiza Theater, Kyobashi, Tokyo, Designed by Prof. Shinchiro Okada, 1924

3



Okura Museum, Akasaka, Tokyo, Designed by Prof. Chuta Ito, 1927

4

Various views regarding buildings advanced for the reconstruction of the city may be conveniently classified under the following items:

(*A*) Efforts are still being made to carry out the principle already mentioned to the fullest extent. The advocates of this principle are those who regard architecture as a machine made at the least possible expense and in the safest and most convenient manner possible for living. They are sympathizers of the view of architects which is known in Germany as Bunkunst, or International Architecture. This group considers that the rise of aesthetic problems is inevitable as a structure assumes some shape, but they leave the consideration of it entirely out of the scope of their plan, while they make every effort toward practicality in the plan of the building and the use of it—the plan to satisfy completely the constructive dynamics, the physiological demands of the occupants and the demands of their social life. As a matter of fact, this kind of architecture had no opportunity of being adopted in the dwelling houses of the higher classes but is found in the poor districts or districts for laborers in a form of apartment house or cheap lodging house. For factory buildings, warehouses, wharves, bridges and others which are not residential buildings, this principle of architecture is freely adopted as far as possible for practical purposes in the architectural scheme.

(*B*) As a result of experience in producing such structures, a new school of aesthetic consideration has come into being. The advocates of the new aesthetic thought maintain that an architecture having a perfect realization of its function is a beauty in itself. It insists on the beauty of Functionalism. In order to explain this view, the instance of the automobile is cited. The automobile in the early stage of its development was built along lines as nearly as possible like the carriage then in vogue, disregarding the shape necessary for a car which is driven by an engine. This is due to the fact that human nature is susceptible to the conventional, entertaining pleasure in accustomed things. But the automobile, gradually departing from the style of the carriage, has to-day found a shape of its own, which is most appropriate for its function of developing speed. Modern men have learned to entertain a pleasurable sensation in regard to this shape which enables a motor-car to develop speed, because the shape of the car is perfectly equipped for the highest efficiency of its function of speed, and is in itself the vital manifestation of that object. This aesthetic principle was chiefly applied to movable architecture, but in the course of time it has become extended to factories, offices and dwelling houses, challenging the old school of aesthetics which maintains that all conditions of beauty exist in form itself. It stands for the aesthetic claim of machinery born of the present mechanical age in which all things are viewed from the standpoint of dynamics.

(*C*) There is also a tendency to find a beauty in the practical nature of a structure other than the beauty of Functionalism. This school of aesthetics may be called Constructionism. It maintains that a form which is brought into being by the perfect combination of building materials essential for a structure, is beauty in itself, thus challenging the school of Formal Beauty like the rest. The reason why this school of aesthetics commands a place of importance in the present architectural science is the fact that it endeavors to realize an architectural form purely its own, by the use of iron, concrete and glass, which constitute the essential materials for the modern building, rejecting any effort to produce by the use of modern materials an imitation of historic architectural form wrought with stone, brick or wood. The possibilities lying in these new building materials has not yet been fully discovered. It is for this reason that architects of this school are making efforts to discover the full possibilities of the new materials for the attainment of a form which is capable of showing appropriately the nature of these materials.

(*D*) Another school of architects assumes an attitude very different from that of the preceding one although there is a close similarity in their products. It maintains that the conception of form pre-exists independent of the question of construction or function. The conception of form, it insists, springs philosophically from the architect's mind apart from any problem of function or plan of building. In this respect, it does not differ from the traditional historism but its conception of form does not necessarily follow the historic form. According to this way of thinking, the various complicated objects which we actually see can always be simplified to elemental solid forms, such as tubular, conical, cubic and round. In a combination of these simplified forms there is the most intrinsic beauty of the plastic form. From this consideration, the architects of this school attempt to bring into being an architectural form by combining these simplified forms and to translate it into reality through the possibilities of iron and concrete. The view maintained by le Corbusier of Paris may not coincide with this way of thinking, but, nevertheless, there is something of this tendency evident in his works. The theory advanced by this school owes much to the Cubists.

(*E*) The view advanced by the school of architects mentioned in section *D* may be considered quite aristocratic because its claim is based on a philosophical conception. When this conception of form is expressed in a historic form, the product will be of the traditional historism. The combination of functional elements and construction materials with the historic form has been almost exhaustively tried during the 19th century and yet it still appeals strongly to the common sense. The buildings of the Tokyo reconstruction are divided into two categories from the standpoint of historism. One is the historism of Western countries and the other is that of Oriental architecture. This paper is not concerned with the historism of the Western style of architecture. The architecture of continental Europe and England in the past adopted bricks and stones as materials. In other words, it depended upon the piling-up method of construction. It is for this reason that the construction of buildings by means of iron and concrete, whether it be of modern, classic, or of renaissance, or mediaeval style, is easy and the workers have become well trained in their skill. Most of the buildings erected for the reconstruction of Tokyo are iron-re-enforced or iron skeleton concrete structures based on this Western historic style.

(*F*) It is apparent to all, however, that the restoration of the historic form of the West in Japan, a country which has an old history and cultural traditions of its own, is meaningless. For this reason, there is a tendency to erect buildings which are historic based on the culture of the Japanese race, using re-enforced concrete or iron skeleton concrete which is appropriate material for the reconstruction of the Capital City.

This standpoint is supported by common sense and there are buildings of this kind in the city although they are limited in number. It must be mentioned here, however, that an undertaking of this kind is confronted with many difficulties. In the first place, the theory of Japanese architecture was fundamentally based on the form used in the construction of wooden buildings and on various conditions of the Japanese climate and weather. The main feature of the Japanese building is that it has a large roof and eaves. The restoration of a building of this form by means of concrete is quite expensive because of the large space, for instance, under the edge of the roof which serves for no practical purpose. Secondly, in this kind of structure, the wide extending eaves naturally prevent light from entering the windows, with the result that the building fails to perform many of the requirements of modern living. Under the circumstances, architecture of this kind will have to be limited to the realm of tasteful private residences or memorial halls which are not seriously concerned with considerations of expense or utility. But despite this, a serious obstacle still exists. If such a structure is taken for granted as tasteful, the conflicting claims of the construction materials and the architectural form will prove to be irreconcilable from an aesthetic consideration. It is not at all rare for a Japanese house to have eaves extending for as far as two meters. These eaves may be constructed with iron-skeleton concrete, but it is not difficult to imagine how unpleasant this would be when one realizes that such a projection of roof would be made of ponderous concrete which is something like stone. Moreover, the quality of lumber is considered to constitute the artistic element of Japanese architecture. If a wooden column which is beautifully planed, showing a silky surface, were replaced by one of concrete, the genius of Japanese architecture would be bound to suffer vitally. The exterior of the Kabukiza Theater in Tokyo, for instance, is modeled after a palace of the 17th century in Japan for commercial considerations, but it is incapable of giving an artistic impression to the observer.

(*G*) From such considerations, any attempt to restore the form of Japanese or Chinese architecture by means of iron and concrete should not be permitted under any circumstances. But this does not mean that a revival of the Japanese style of architecture in the modern city is hopeless. However difficult it may be to restore the form of architecture prevailing in the 16th, 17th and 18th centuries, a close scrutiny of the historic architecture of Japan reveals that there is something quite modern in its spirit. The theory of using lumber, which has been traditionally handed down in the art of building construction, for instance, has the principles of dynamic calculation, definitely regulating the thickness of bean, ridge, rafter and column according to the size of the house, showing the most advanced method of construction by fitting lumber together without using nails. In the case of a dwelling house, the exterior appearance of the building has always been a matter of secondary consideration, except in the case of temples, but the object for which it was erected has always been of primal importance. In building a tea room in particular, all waste of space is avoided as much as possible, so that not only is perfect functionalism adopted but the tea ceremony is provided with a set of regulations which controls even the conduct of persons to suit the function of the room. The Japanese tea room which has taught even as keen an architect as le Corbusier, has its beginning in the principle of functionalism. The standardization of various parts of the Japanese building which had attained a high stage of development in the 17th century, such as, for instance, mats and paper screens which are of the same sizes to fit any house, are the most effective example for the revelation of the co-operative life. Not only are these new architectural ideals found in the old architecture of Japan but it can hardly be said that a revival of the Japanese architectural style by the use of modern materials is improbable. I may be permitted to quote Prof. Shozo Uchida of the architectural department of the Tokyo Imperial University. According to his opinion, "The construction which is accomplished according to a principle which is nearest to that of the Japanese wooden structure is the iron skeleton concrete construction because both are erected on the basis of the skeleton frame. Unfortunately the iron skeleton concrete structure had its development in the materialistic atmosphere of the commercial cities of America with the result that it has become a matter of course to assume such a form as it has to-day. If it had developed in Japan, it must have certainly been based on the style of wooden architecture, finding some artistic articulation in its form." With Prof. Uchida, we believe that this affinity of the iron skeleton construction to Japanese architecture will give birth to a most artistic and constructive form of iron skeleton concrete structure in the course of time.

In concluding this essay on the reconstruction of Tokyo and Yokohama, I may add that Japan which as a nation is undertaking (as is Northern France) a construction program on the largest possible scale, and which received from the rest of the world, great sympathy at the time of the earthquake and fire, and assistance for the reconstruction of the capital, is carrying on her work of reconstruction, anticipating that she may be able to contribute some new theory and style to the architecture of the world of to-day.

Testing European Air-Route Possibilities

The prospect of opening a regular Eurasia airmail service through the Northwest is indicated by the trial flight from Peiping to Tahcheng, the *terminus in Sinkiang, an achievement which will be written large in the aero*nautical history of China. To blaze a new route into the distant regions of the Northwest is an adventure accompanied by many difficulties and dangers. An accident in a region dotted with mountain peaks and wide deserted plains would be almost inevitably disastrous.

In view of the known dangers involved, the Eurasia Aviation Corporation has purchased new Junker planes and has done its utmost to ensure safety along the route by making arrangements for providing facilities at various places for the storage and transportation of fuel and the establishment of radio plants for communication between ground stations and machines in transit. This new airmail route, if all goes well, will be formally inaugurated in April or May next, and a through service to Berlin will be started if the Corporation succeeds in concluding the necessary agreement with Russia.

The new service through the Northwest includes a two hour and fifty-five minutes' flight from Peiping to Pailinmiu, Suiyuan Province, a distance of 520 kilometers; a four hour and twenty minutes' journey from Pailinmiu to Juoshuiho, Ninghsia Province, 780 kilometers; a three hour and forty minutes' trip from Juoshuiho to Hami, Sinkiang Province, 660 kilometers; a two hour and thirty minutes' hop from Hami to Tihwa, 460 kilometers; and a two hour fifty-five minutes' flight from Tihwa to Tahcheng, 500 kilometers. The test flight will cover a total distance of 2,920 kilometers.

With a vast desert waste, very sparsely populated, and a range of high mountains, the journey between Peiping and Hami offers little possibility of making a safe emergency landing. The section between Hami and Tihwa, however, is favored with stretches of level ground suitable for landing in case of necessity, but this area is very small compared with the total distance to be covered by the route. The Eurasia Aviation Corporation, however, is taking all possible precautions to ensure the safe operation of the long-distance service which it hopes soon to have in regular working order.

F. L. Smidth & Company A/S has Fiftieth Anniversary

(*Continued from page 38*)

From the opening of the office in Japan, and up to now, the firm has supplied kilns with a total output of about 8,000,000 barrels per year, which represents more than one quarter of the total cement production in Japan. One of the biggest orders the firm has had was from the Asano Cement Company's new plant at Nishitama, for which all the cement making machinery was delivered by F. L. Smidth & Co., and where a special rapid hardening cement the Velo Cement, invented by F. L. Smidth & Co., is turned out.

In China the firm has built the Chee Hsin Cement Company's Tangshan Works, and supplied this plant with machinery for its various extensions.

The firm has furthermore delivered all the machinery for the Kwangtung Provincial Government's cement plant near Sai-chuen, which is just now on the point of completion. Another order was received some years ago from the Liu Ho Kuo for a plant to be built in Honan Province, which plant has, however, not been completed due to the outbreak of civil war.

Other plants in the Far East supplied with the firm's machinery are the Haiphong Works in Indo-China, the Siam Cement Works at Bangsue near Bangkok, and the Padang Works in Sumatra. All of these plants either originally were built by F. L. Smidth & Co., or reconstructed by them and all of them have since then been extended to double or triple capacity by F. L. Smidth & Co.

Electrical Engineering in Ceylon

(*Continued from page 32*).

electricity. The preparation of the new power station site commenced in September of that year; the work of erection began in January, 1928, and was carried out with expedition, the first boiler and generator being ready for service in December of the same year.

The present turbine room is 112 feet by 40 feet wide, but as in the case of the boiler room, arrangements have been made to permit extensions being made to the building, if at a later date it is found necessary to instal additional plant. The present equipment consists of two 3,000 r.p.m. turbo-alternators each of 3,750 k.v.a. capacity, generating electrical energy on the 50 cycle three phase system at 11,000-volts between phases. All auxiliary equipments, such as condensate pumps, circulating water pumps, etc., are placed on the basement floor.

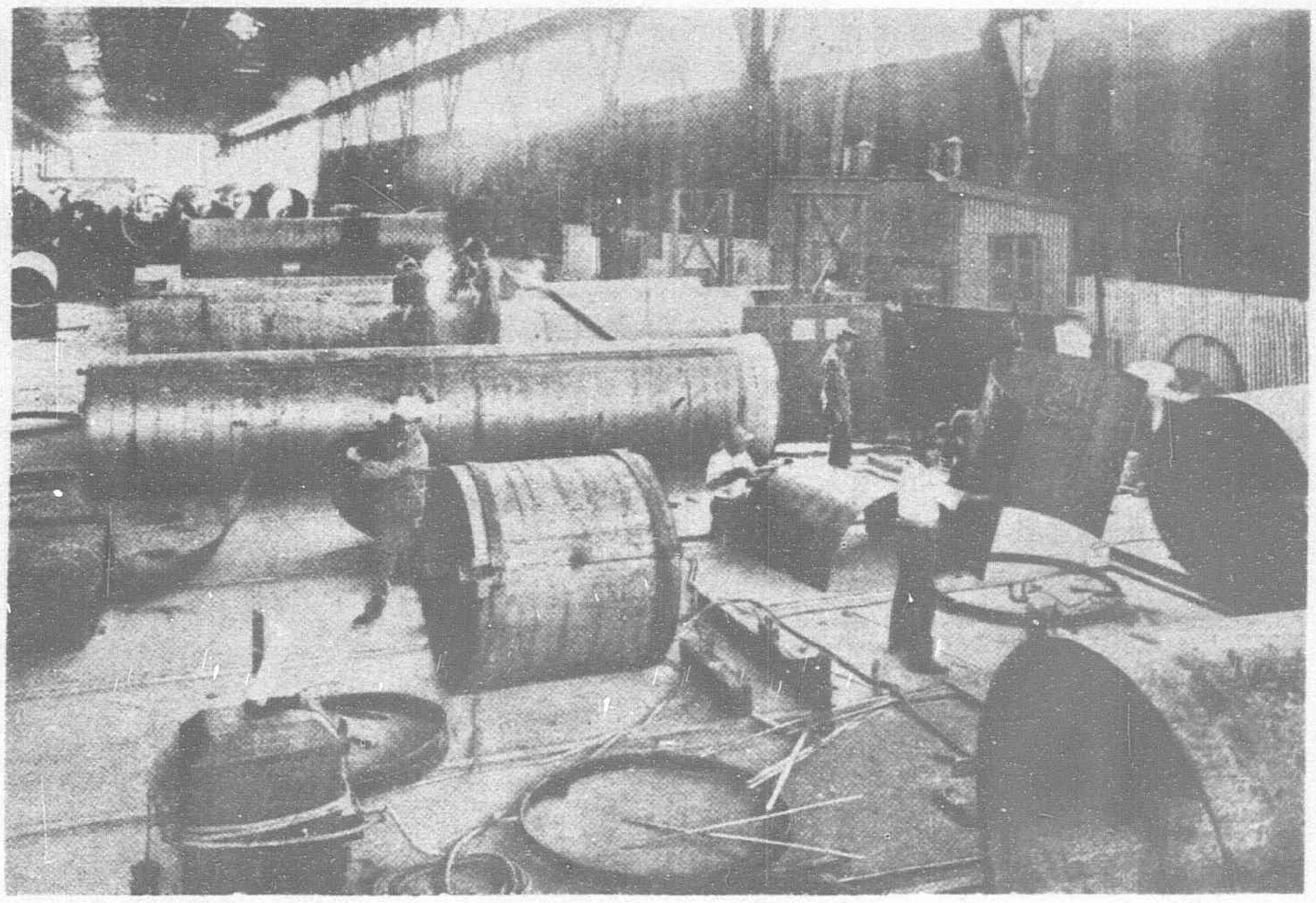
The electrical energy is transmitted from the power station at 11,000-volts by underground feeder cables to substations located at various places in Colombo. At present eighteen such substations have been constructed. The complete scheme of electricity supply in Colombo provides for 24 substations, and the additional substations will be constructed as and when required. For the purposes of the distribution system, Colombo has been divided into two areas, and two main radial feeder cables will supply each area. The substations in each area are connected together by a ring main so designed that any section of the main can be isolated without interrupting the supply to any substation.

It is expected that there will be extensive development of electricity both for domestic purposes and for power as soon as the new distribution system is in an advanced state of completion and the 33,000-volt line to Negombo in the north and Kalutara in the south erected. It is not intended that Government shall carry out any extensive wiring schemes for consumers' premises, all such work being done by local contractors. The Department's development policy is not to make profits but to encourage the demand for electricity in every possible way.

By placing at the disposal of the largest possible number of people in Ceylon a supply of electrical energy at the lowest possible rates, it is hoped that the valuable development of the economic resources with which this Island is so generously endowed will be only a matter of a comparatively short time.—*The Times of Ceylon*.

Arc-Welding in Japan

By MAURICE TAYLOR, Welding Technician, The Lincoln Electric Company in "American Machinist"



Electronic Tornado installation at the pipe factory of the Kawasaki Dockyard Co., Kobe, Japan

ANY consideration of the efficiency of arc-welding in Japan must be tempered with the realization that the Japanese are an oriental people and have all the traditions and customs peculiar to the Far East. Reconciliation of American and European efficiency with Japanese easy-going ways of living and thinking often results in a mild sort of chaos. We cannot judge the Japanese by our standards, but must rather judge their industrial progress and efficiency by their own standards.

The Japanese are probably the most progressive of the eastern peoples. This is due to an intelligent leadership which has recognized the value of American and European industrial organization and methods. The result is a somewhat higher standard of living and a more prosperous nation.

It is natural that the Japanese should be large users of arc-welding. Their engineers studying in America, search for the most modern methods in every industry and upon returning to Japan set about to imitate them. Arc-welding is used in Japan in almost as many applications as in this country; ships, buildings, pipe, pipelines and machinery all being welded. Industrially, the Japanese cannot approach American efficiency, for while labor is cheaper, costs are increased by slow leadership and poor tools.

The Japanese executive and engineer is the product of a caste society. While he may be trained in several universities, including the best in the world, he is not equipped with actual shop experience. This is of vital importance, as the stories which come out of the Soviet Republic indicate (where the same situation exists, but for a different reason). The purely theoretical engineer cannot realize fully the value of skilled labor, shop "kinks," good tools. This is not to be taken as a criticism of the Japanese, for these university men are so learned as to believe in welding soundly and thoroughly, which many of our purely shop-trained industrialists do not. It is difficult, however, for the Japanese to put their faith into practice.

Labor in Japan is not paid very much, but it is treated with the utmost courtesy. To lose one's temper is a sign of insanity and low morals. No one is ever "bawled out" in a Japanese shop; no one is ever spurred to greater haste by his foreman. The worker can lay off for a few days and return without an explanation—without losing his job. We do not condemn this gentle practice, but cite it as a factor to be considered in the industrial picture.

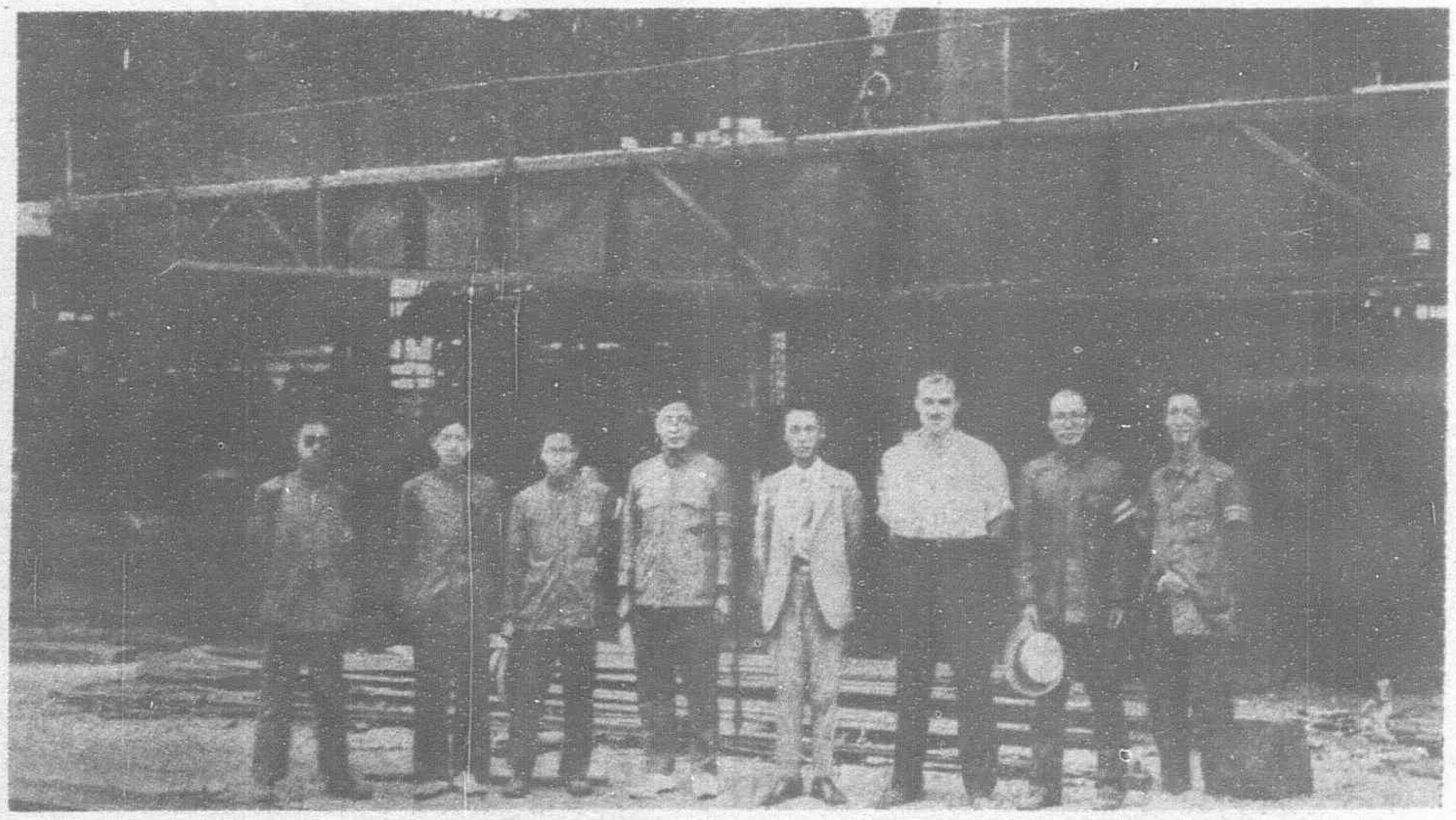
Japanese welder operators are extremely skillful. They begin as apprentices when boys, receiving $20 a year while they learn. A full-fledged welder is paid about $1 a day, and he works in his stocking feet, with light gloves and a hand shield.

The welding equipment used is mainly the old a.c. type, with a few modern d.c. machines. The cost of the American or European equipment is in many cases prohibitive. Unlike Australia, where the coated electrode is used in numerous applications, this type of rod is rare in Japan. Several American electrodes are used, but many of the companies make their own wire. This native wire is usually of poor quality. One company produces a coated electrode which "shields" the arc, but the presence of borax and other elements in the flux are as hard, and as easy to remove, as baked enamel. The small-capacity machines allow the use of only small-diameter wires, and where successive beads need be applied this slag forbids the use of this type of rod.

The $\frac{1}{8}$-in. and $\frac{5}{32}$-in. diameter electrodes, in use in most applications, require the running of seven to nine beads on a joint which would take but one bead of metal from a large diameter "shielded arc" electrode of the type used in this country.

In spite of these difficulties welding progresses, labor is so cheap that the additional time is not considered, although the cost of electrode runs very high. In one pipe factory, the cost of electrode is 75 per cent of the cost of manufacture.

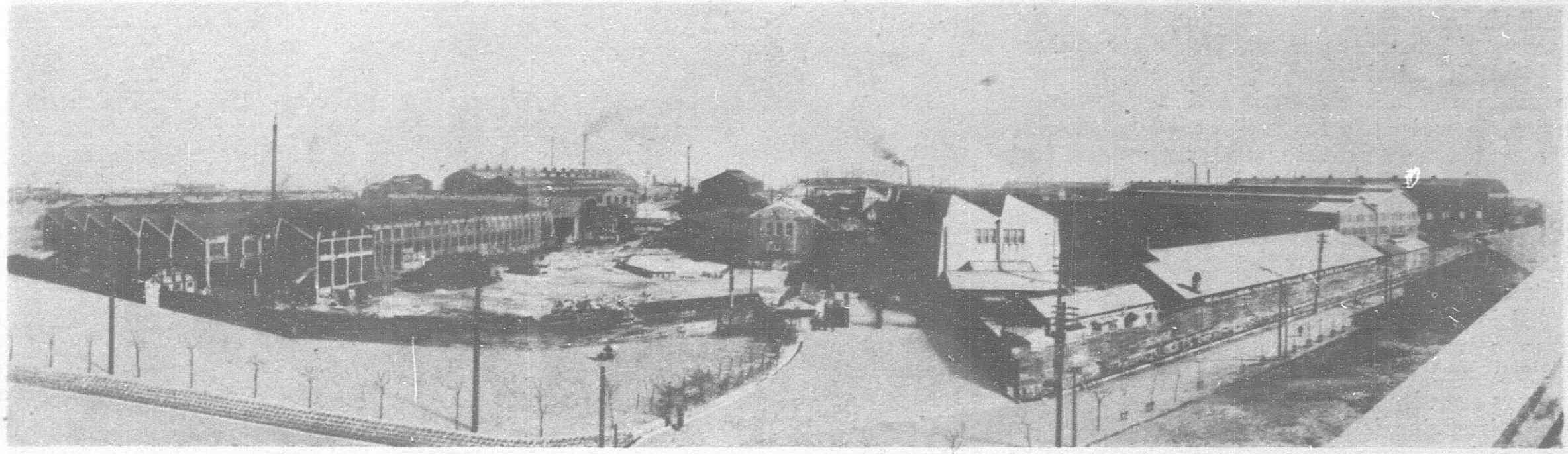
One accompanying photograph shows a 60-ft. overhead crane. This crane was originally a 30-ft. unit, but it was cut into halves and a 30-ft. section welded in the center. New rails and fittings were fused into place with the arc. The resulting job was as neat and strong as any to be seen in this country. It is typical of the Japanese engineer that no question should have entered his mind when the larger crane was needed. Rebuilding of the old crane was the accepted solution to the problem.



The author and a group of Japanese welding engineers and technicians, standing in front of the arc-lengthened crane. Fifth from the left is Prof. Takesi Okamoto, outstanding Japanese welding authority

The author was privileged to repair an 80 ton forging hammer with the shielded arc process. The holding arm of this unit, a heavy forging, cracked and a replacement would have meant months of delay while a new unit was shipped from abroad. After V'ing out the crack and filling it with metal, a steel plate was tied across the fracture and fused into position. The machine was out of service but two hours, and after four weeks of continual operation did not show the least sign of failure.

(Continued on page 50)



General view of the Kobe Shipyard and Engine Works of the Mitsubishi Shipbuilding and Engineering Company

The Kobe Shipyard and Engine Works of the Mitsubishi Shipbuilding and Engineering Company, Limited

A Brief Description of the Works with Particulars Regarding Products Manufactured

The Shipyard and Engine Works occupies the whole of the Wada Promontory at the south-west of Kobe harbor. It possesses 170 buildings including workshops, store houses and offices which cover 36 acres of the total 98 acres comprised in the vast plant. The staff number 700, and the workmen in constant employment are 4,100.

Two breakwaters built out in the sea off the works' compound form an immense basin, in which are floating docks, moorings and buoys. Included in the equipment are a 100 ton tripod crane, 60 and 15 ton floating cranes, numerous high-power tugs, launches and motorboats.

A private branch railway connects the Works with the Wadasaki railway station, and a complete system of rail line connects each ship on shore. Various locomotives, cranes, as well as a Goliath crane and motor trucks afford ample facilities for quick-handling and transportation.

The shipbuilding berths number five, and the floating docks three, particulars of which are as follows :—

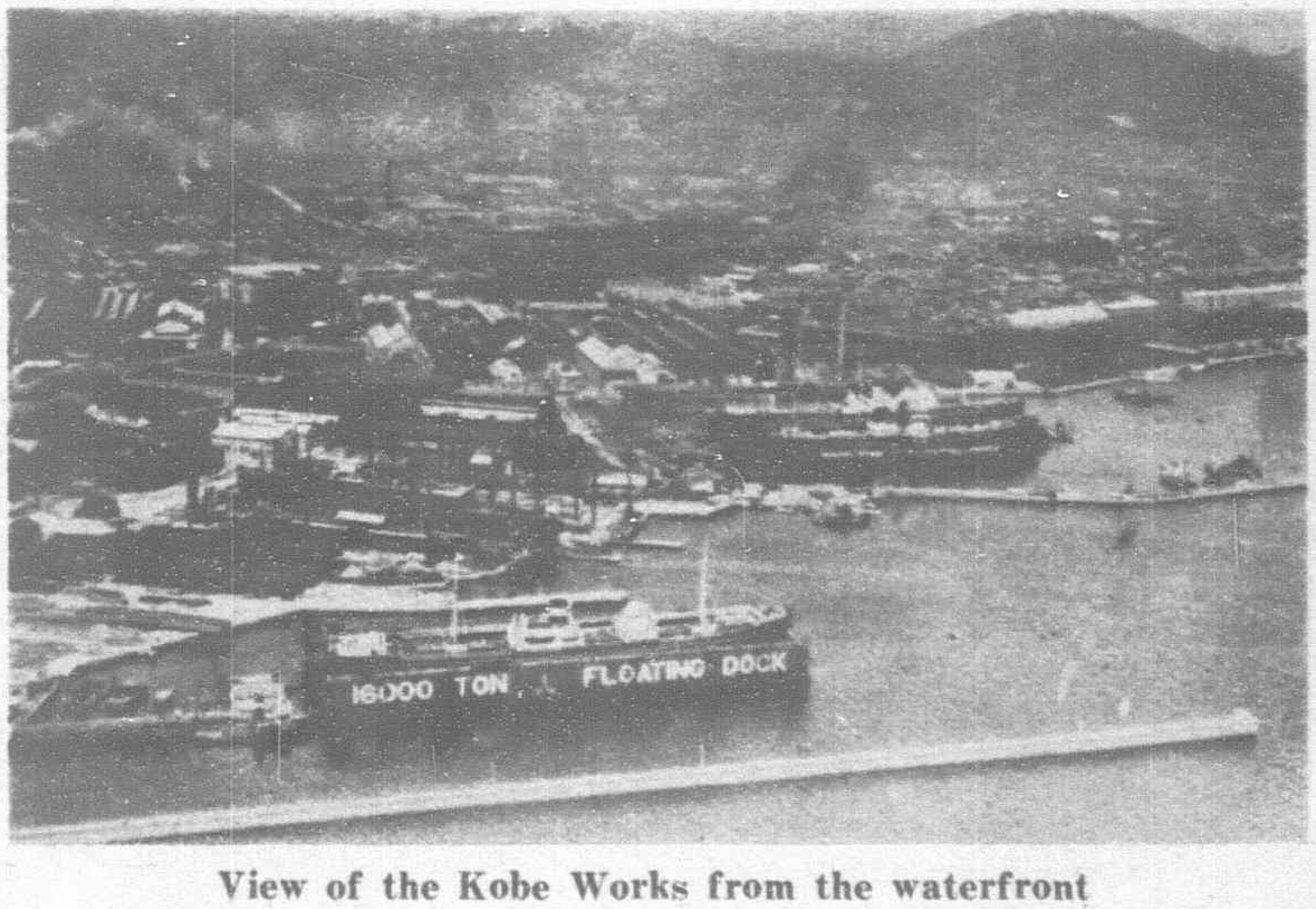
SHIPBUILDING BERTHS

	Length	*Breadth*	*Maximum length of vessels constructed*	*Maximum gross tonnage of vessels constructed*
	Feet	*Feet*	*Feet*	
No. 1	400	30	420	10,000
No. 2	400	30	420	,,
No. 3	400	30	420	,,
No. 4	344	64	Two vessels can be constructed at one time.	

FLOATING DOCKS

	Tons	*Length*	*Width at entrance*	*Depth*
No. 1	7,000	413′ 0″	59′ 0″	22′ 0″
No. 2	12,000	532′ 0″	69′ 0″	26′-0″
No. 3	16,000	410′ 0″	93′-7″	30′ 0″

The No. 1 Dock was constructed at the Nagasaki Shipyard of the Company, while No. 2 was built by the Works itself in the year 1908, and is the largest ever constructed in Japan.



View of the Kobe Works from the waterfront

The manufacture undertaken in the Works is very wide in range, and it is quite beyond the scope of this article to give more than a brief résumé of some of the main lines of manufacture. Attention, however, may be called to the following, representing a few of the things in which the Works has specialized.

Mitsubishi-Ljungstrom Turbo-generators

As is well-known, this turbine is of very meticulous and elaborate construction, and is so highly efficient as to be capable of running continuously at 40 per cent overload. As a consequence, since manufacture was commenced in 1919 at the Works, the demand for this special system of power unit has increased year by year, and a total output of over 275,000 kw. has up to now been supplied, not only to clients in Japan, but to China, Korea and Manchuria.

The turbine is designed as pass-out and back-pressure types, and another is supplied with preheater. In the past, units of up to 8,000 kw. have formed the bulk of the orders, but now those of over 10,000 kw. can be undertaken.

Mitsubishi Sectional Boilers and Mechanical Stokers

This boiler is of horizontal tube construction with headers, developed by the German boiler makers, Messrs. Duerrwerke, with whom a manufacturing agreement exists. Two standard types are manufactured, namely, the longitudinal drum type for small plants and the cross drum for large units, both of which are light in construction and have a higher steaming rate compared with other types of boilers of similar capacity. Besides being easy to operate, clean and repair, these boilers are less expensive to erect, and, combined with the Mitsubishi mechanical stoker, form a most efficient and serviceable unit.

Mitsubishi Water Turbines and Speed Regulators

The water turbines manufactured at the Works cover all the superior types, including the Francis, super-high speed Francis, Pelton, Propeller and Kaplan types, and the Works is in a position to undertake the design and construction of vertical, horizontal, vortex, open and any other types to any sizes.

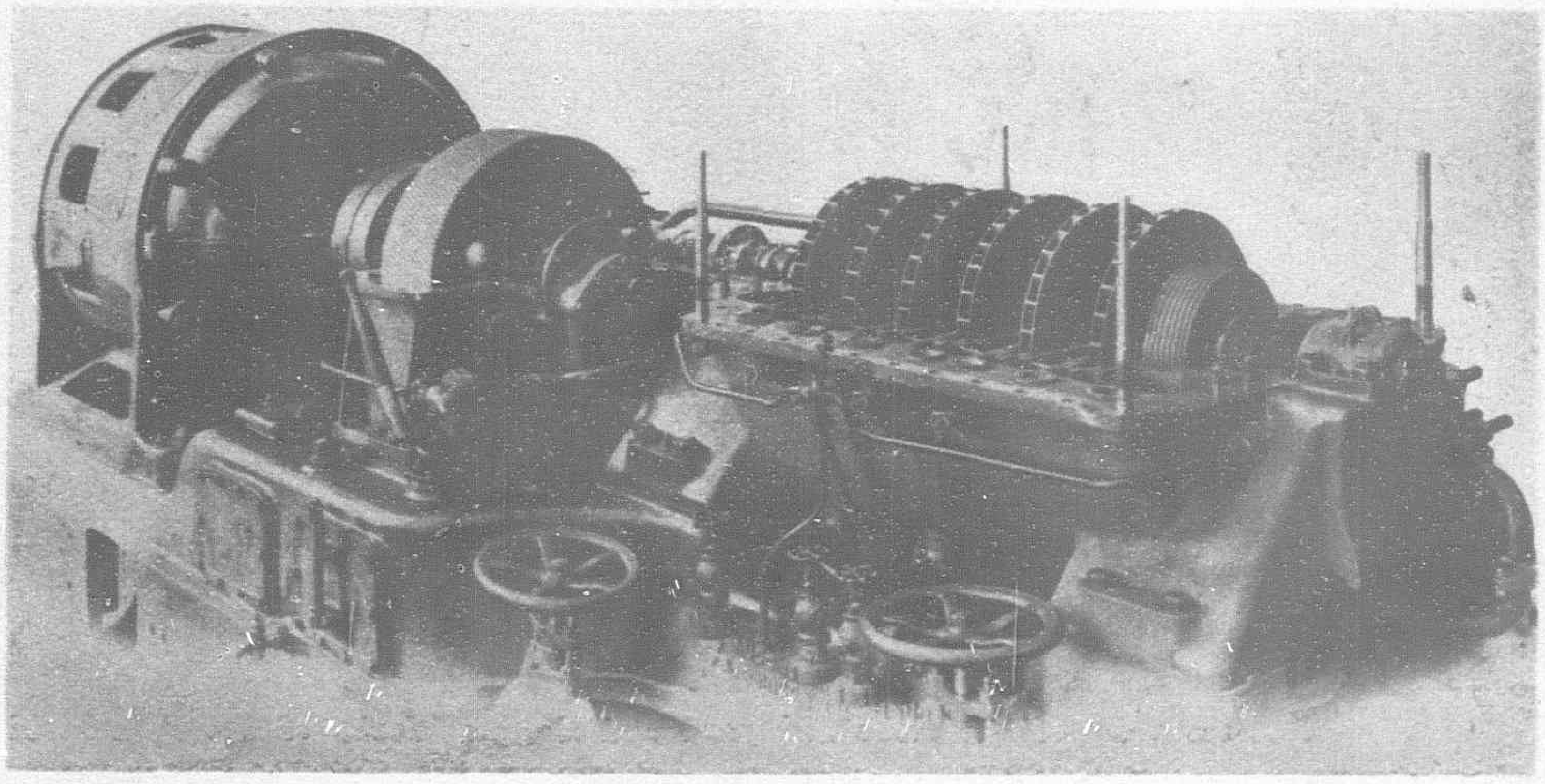
Mitsubishi Diesel Engines

As early as the year 1916, a 250 b.h.p. Diesel engine was made in the Works. Later on a manufacturing license was entered into with Messrs. Vickers

Limited, and by incorporating the special features of its own engine, the Works has evolved an ideal Mitsubishi Diesel. Special reference may be made to the airless injection four-stroke engine, in which the fuel system is most simple, safe and exact, reducing enormously the fuel consumption. Furthermore by the introduction of a special patented mechanism for driving the fuel pump, the fuel injection pressure is maintained constant and supply can be dexterously controlled mechanically.

Being of the airless injection type, no compressors are needed, and accordingly, labor, expense and risk attending the use of compressors are dispensed with.

This engine is not only used as main drive for marine propulsion and for coupling to dynamos, but also is widely applied for generating purposes on land.



800 h.p. Mitsubishi Turbo Blower manufactured at the Kobe Works for the Asaka Gas Company, Ltd.

Mitsubishi-Vulcan Gears and Couplings

These gears and couplings are used with internal combustion engines, which have recently shown such extraordinary development as prime movers in mercantile vessels and warships, for synchronizing the revolutions of the engines, when Diesel units are combined to obtain big powers and also for other similar purposes, and are capable of maintaining almost perfect uniformity of revolution.

Besides being most simple to manipulate, they possess among other features, the advantages of protecting delicate parts of the machinery from undue stress and shock, and prevent overloading of the shaft.

Mitsubishi-Bauer-Wach Exhaust Turbines

The advantages of utilizing the remaining heat energy in the exhaust steam from a reciprocating engine for driving a turbine have been realized from early times, but on account of the difficulty of combining these two kinds of engines, possessing turning moments of quite a different nature, the exhaust turbine was connected to a propeller shaft quite independently of the shaft driven by the reciprocating engine, and the two engines were connected only by means of an exhaust steam pipe. Accordingly, a vessel fitted with main engines on the so-called combination system, had of necessity to have at least three and in some cases four propellers, and thus only a vessel of big size would allow such an installation.

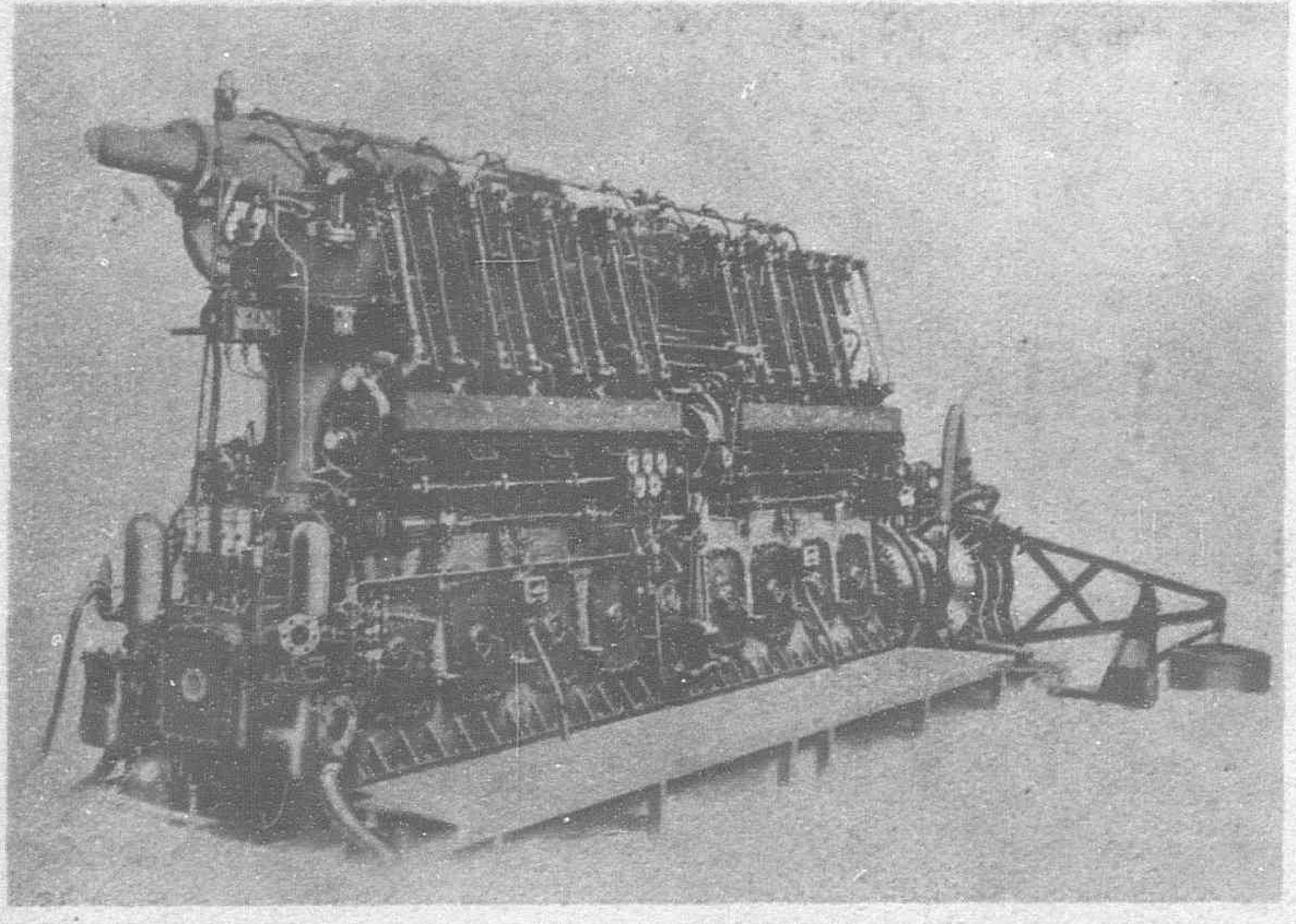
Drs. Bauer and Wach succeeded in combining these different kinds of engines to one shaft in a most satisfactory and safe manner, permitting the use of this combination system even in small single-screw vessels, such as steam trawlers, not to mention vessels of big tonnage. As a result of this successful application, a gain in speed of more than one nautical mile with the same fuel consumption, or an economy of over 20 per cent in consumption of fuel if at the same speed, is obtained, when compared with vessels installed with reciprocating engines only.

In consequence, this system has come into very rapid use, and is capable of being applied to existing reciprocating engines. During the comparatively short period from January 1927 to April 1931, vessels installed with this exhaust turbine number 87 new boats, of a total i.h.p. of 253,780, and converted ships number 113 of a total i.h.p. of 674,490, or a total of 200 vessels with 928,270 i.h.p.

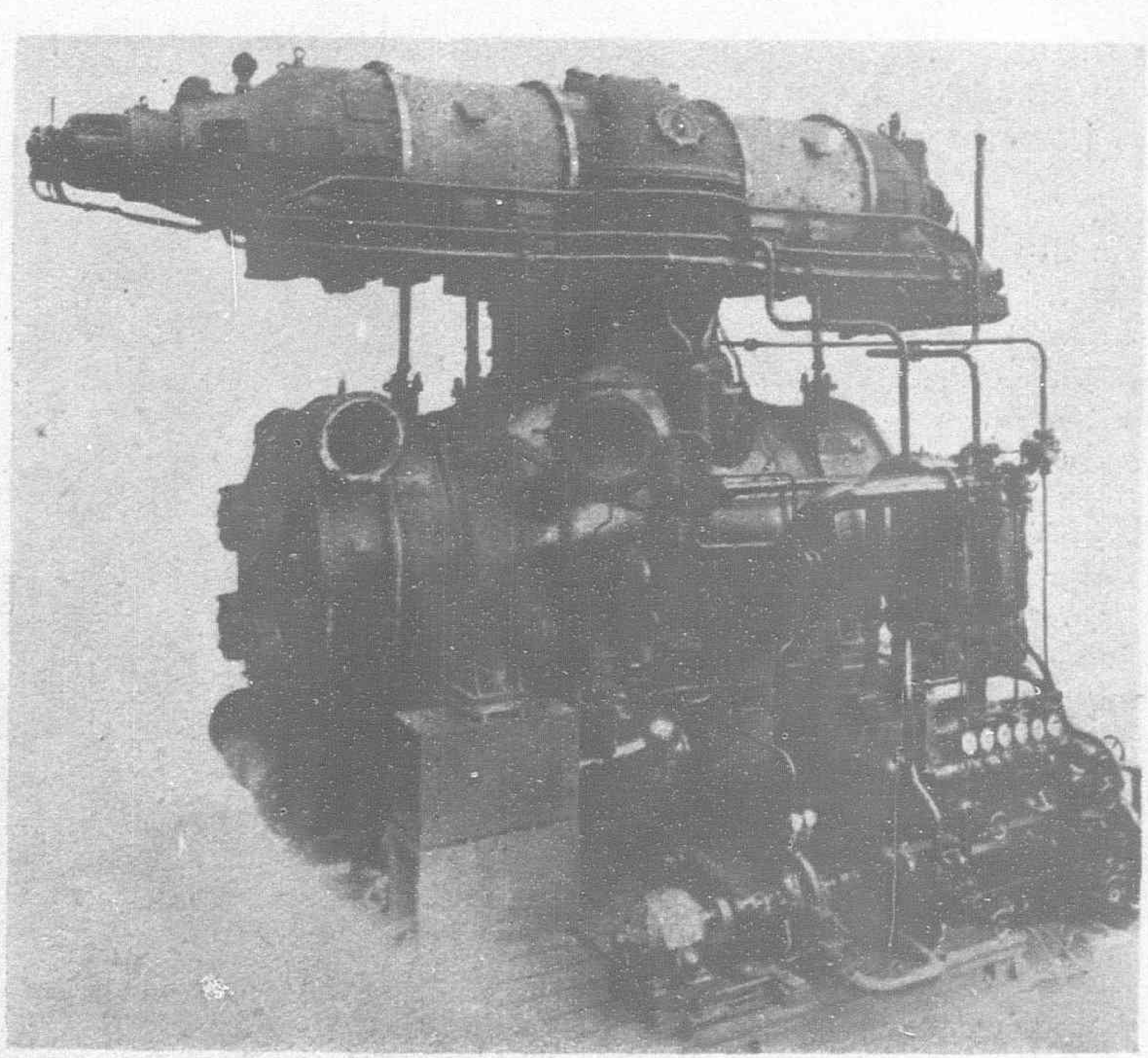
This Company entered into a license agreement with the Deutsche Schiff-und Maschinenbau A.G., and we have now under construction two sets of exhaust turbines, one being a conversion for the *Konan Maru* of the Kobe Sambashi Kaisha, and the other for a new 8,800 ton cargo boat for the Ishiwara Sangyo Kaiun Kaisha. The former will be the first vessel to be fitted with this system in Japan.

Mitsubishi Locomotives

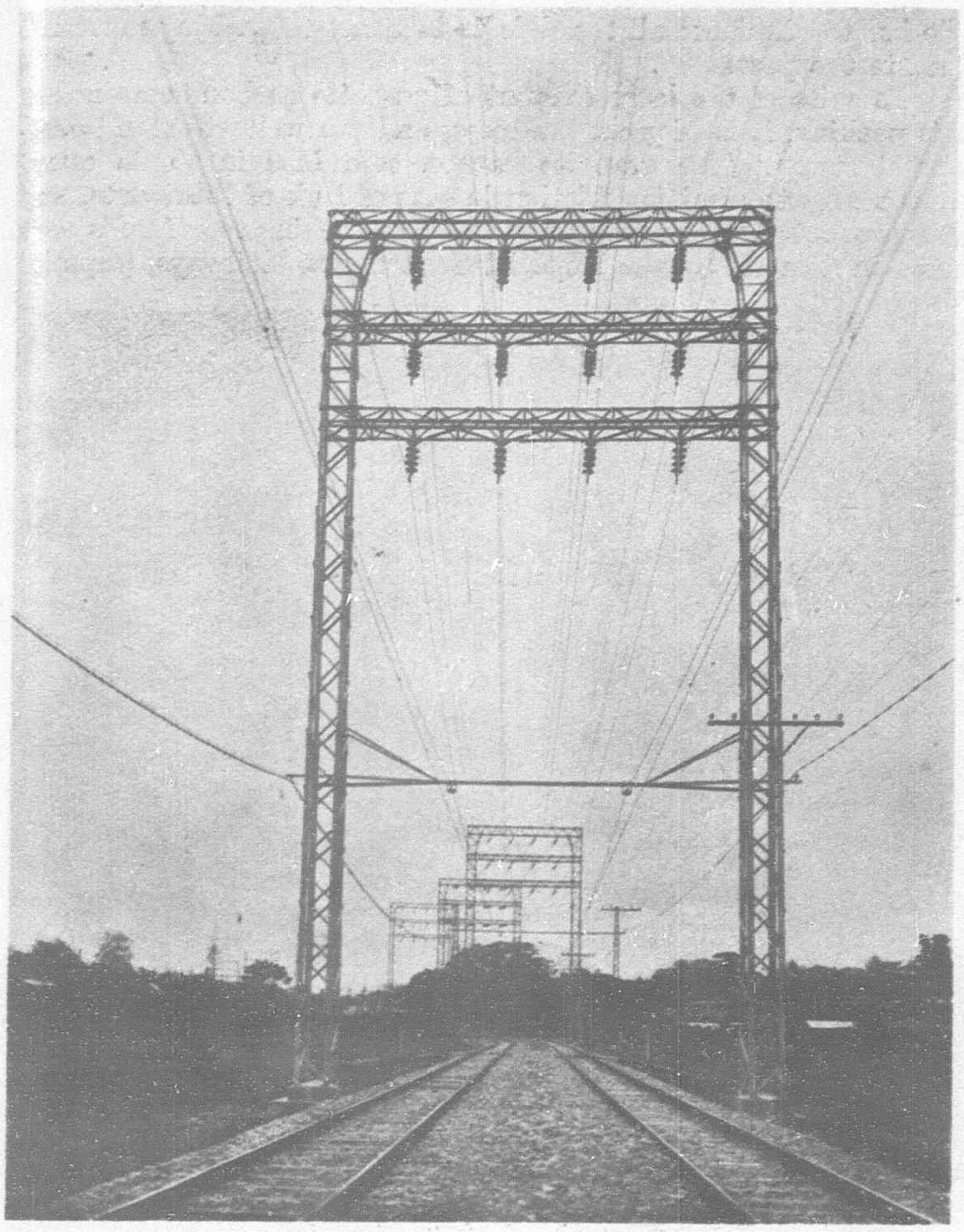
It is hardly necessary to say that the development of means of transportation contributes greatly to the progress of civilization; and the Works has interested itself for many years in this branch of engineering. To cope with the ever-increasing demands for superior



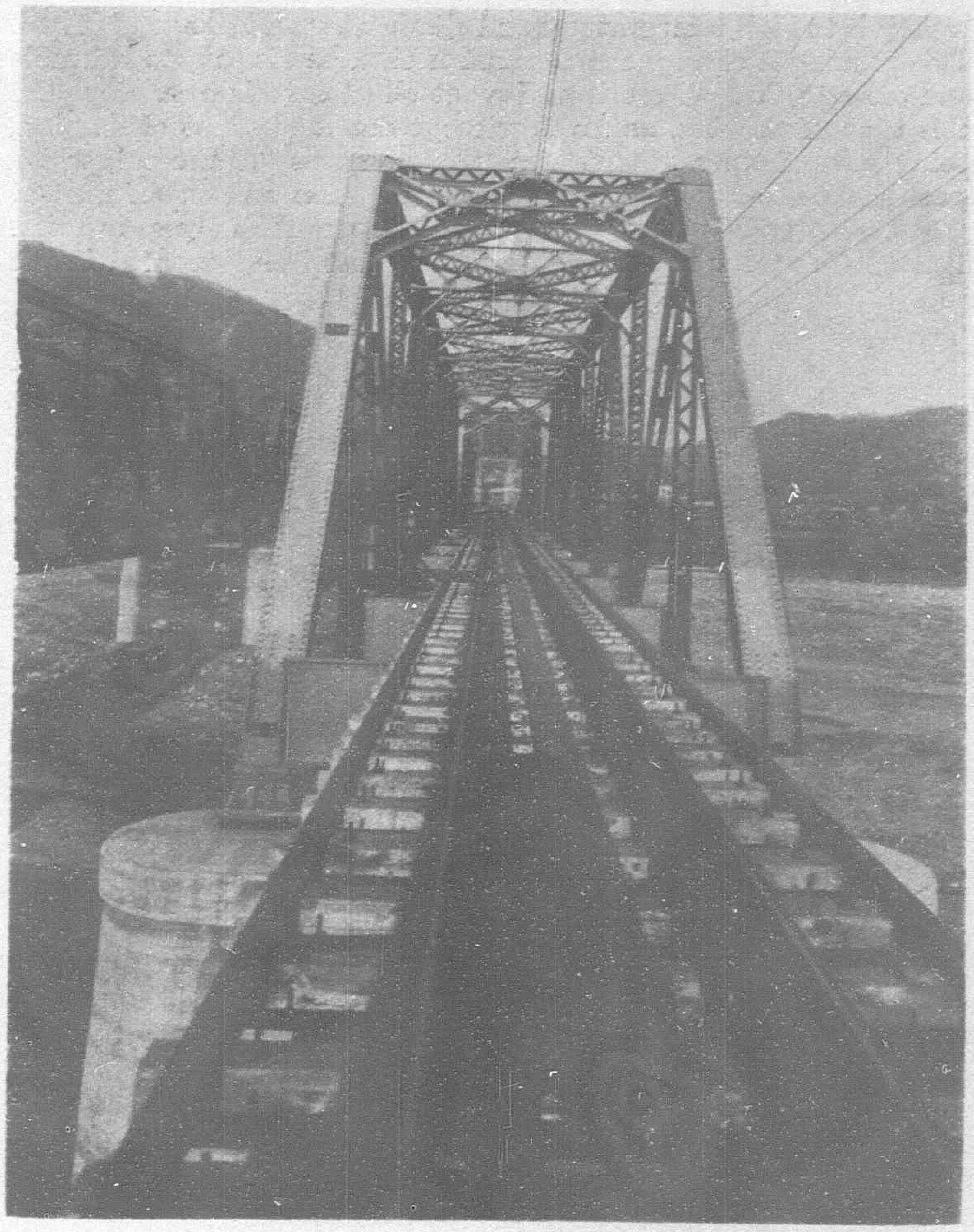
Main engine for the Motor Vessel "Midori Maru" of the O. S. K., 4 Cycle 920 h.p. Diesel engine manufactured at the Kobe Works



5,000/7,000 k.w. Mitsubishi-Ljungstrom Steam Turbine Generator manufactured at the Kobe Works for the Mitsui Kozan Kaisha, Ltd.



Gantry pole manufactured at the Kobe Works for the Tetsudo Kaisha Ltd.



Bridge constructed at the Nagasaki and Kobe Works for the Odawara Kyuko Denki Tetsudo Kaisha Ltd.

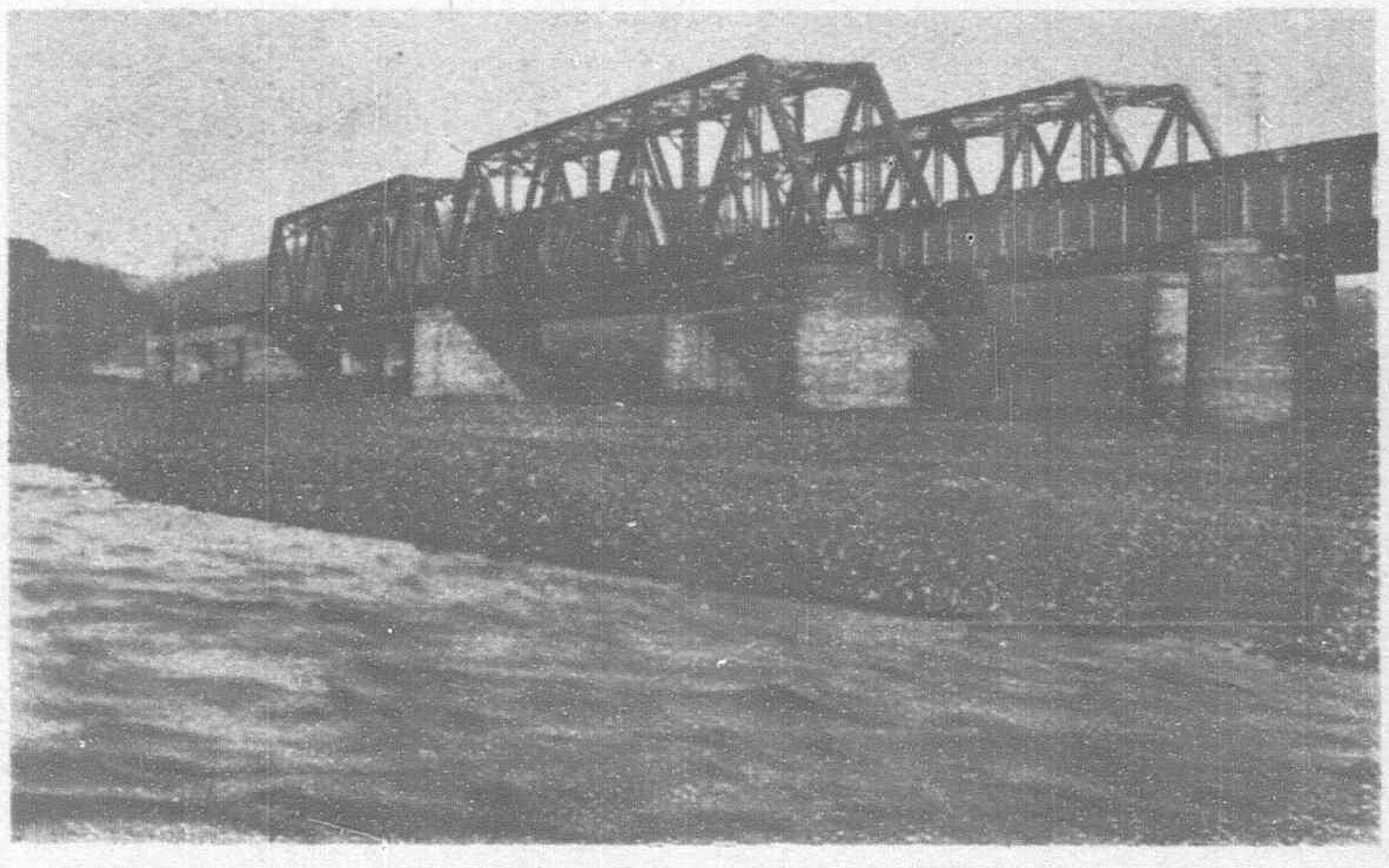
rolling stock and equipment, the Works is concentrating upon the production of steam and electric locomotives together with air brakes, embodying the highest standard of workmanship, based upon years of study and experience, at the lowest cost. Several patents have been secured relating to these apparatus. The principal customers for locomotives and air brakes are the Imperial Government Railways, the South Manchurian Railway Company, the Korean Railway Bureau and the Formosan Railway Bureau, and it is gratifying to note that the utmost satisfaction has been given these important clients.

Diesel Locomotives

Mitsubishi Electric-Diesel locomotives are the joint product of the Works and of a sister concern, the Mitsubishi Electrical Engineering Company Limited. The Works, which is responsible for the mechanical parts of the equipment, and is incidentally the oldest Diesel engine makers in the country, enjoys a reputation of the highest as makers of first class rolling stock, while the makers of the electrical parts, the Mitsubishi Electrical Engineering Company Limited, has had long experience in electric railway equipment.

Mitsubishi Diesel Road Rollers

The Diesel-driven road roller having completely eliminated all the defects of the steam and gasoline prototypes, it has now driven the latter off the streets.



Bridge constructed at the Nagasaki and Kobe Works for the Odawara Kyuko Denki Tetsudo Kaisha Ltd.

The Mitsubishi Diesel road roller, which is based on the knowledge and experience gained in the manufacture of well over one hundred of the steam-driven variety and 100,000 b.h.p. of Diesel engines, is absolutely a home-made product, and its efficiency and splendid performance are evidenced by the trials of 15 of these macadam type Diesels of a capacity of 10.5 tons, with 35 h.p. each, recently completed to the order of the Government.

Some of the special features embodied in the Mitsubishi Diesel road roller are :—

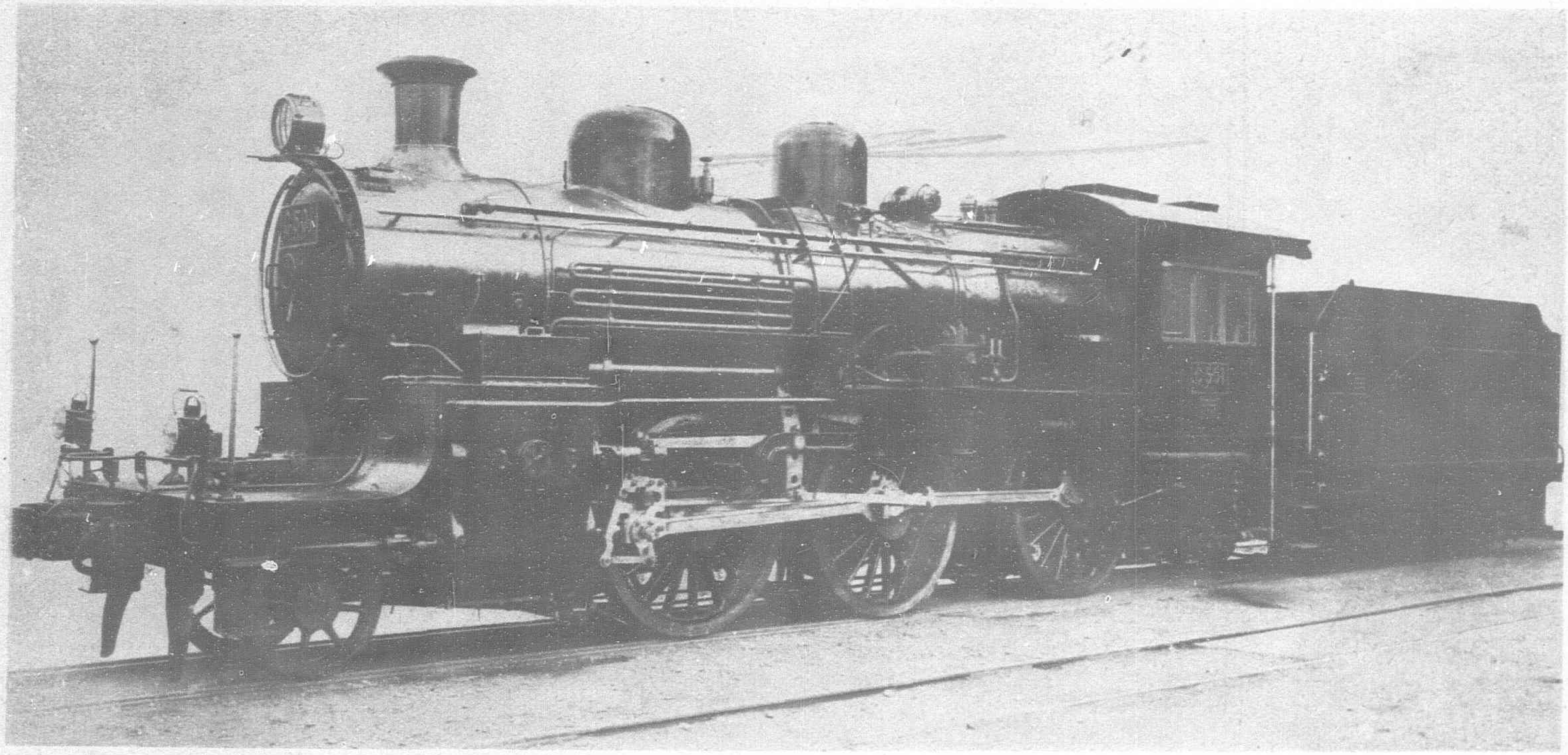
1. The high power of the engine, permitting of the roller to travel up gradients of one in seven.
2. Low fuel consumption of about 200 grams per h.p. when using Tarakan or corresponding grade oil fuel of specific gravity of 0.95 or thereabouts.
3. Variable speed. The roller can be adjusted to three speeds of 1.5, 3.0 and 4.5. kilometers per hour, operated by a mechanical arrangement similar to that in automobiles.
4. Transmission system of special design. The steering mechanism is robust and permits of easy maneuvering.

Fukao's Patent Metallic Packing

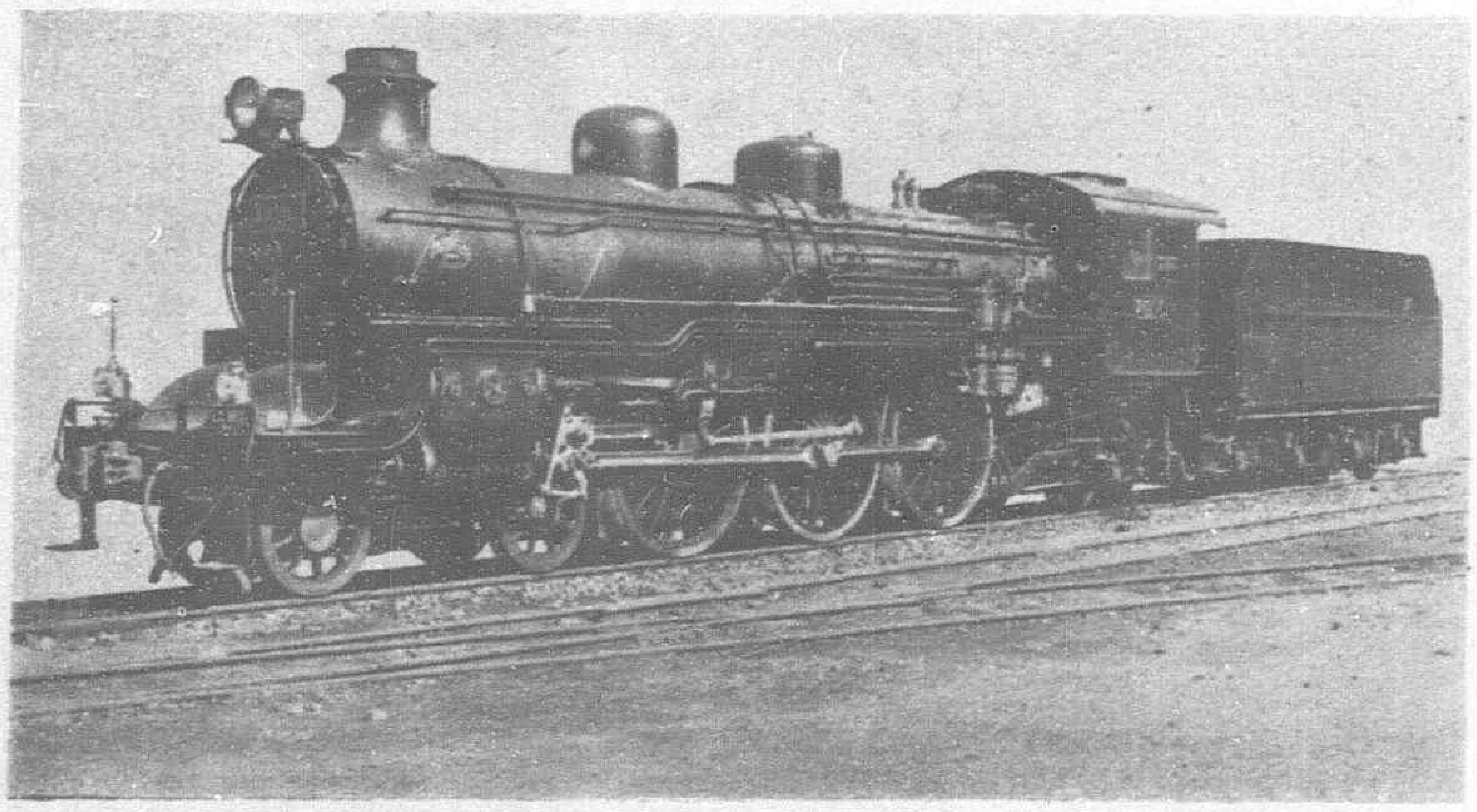
As high-pressure, high-temperature steam has lately come to be employed, metallic packing has come into favor.

After years of study, the Works succeeded in producing a most ideal metallic packing, possessing great hardness, most resistible to high temperatures and eliminating all leakage of steam. This packing is of very simple construction, and is easy to assemble and disassemble. There is no fear at all of trouble occurring with this type of packing, and it is without doubt the best of its kind, being made from a patented metal, known as "Y" metal, which was produced after long years of investigation and experiment at the Works, and is strong and durable, as well as cheap in price. This "Y" metal is a specially composed cast iron, invented in the Works, to eliminate all the defects inherent to packing materials used in the past.

In spite of the large amount of graphite carbon contained in this packing, it is of great hardness, and can well withstand overheated steam. The graphite carbon contained in ample quantities serves to diminish friction in case of lack of lubricants, and thus prevents injury to piston rods. The packing therefore is very much in demand by the Imperial Government Railways, Imperial

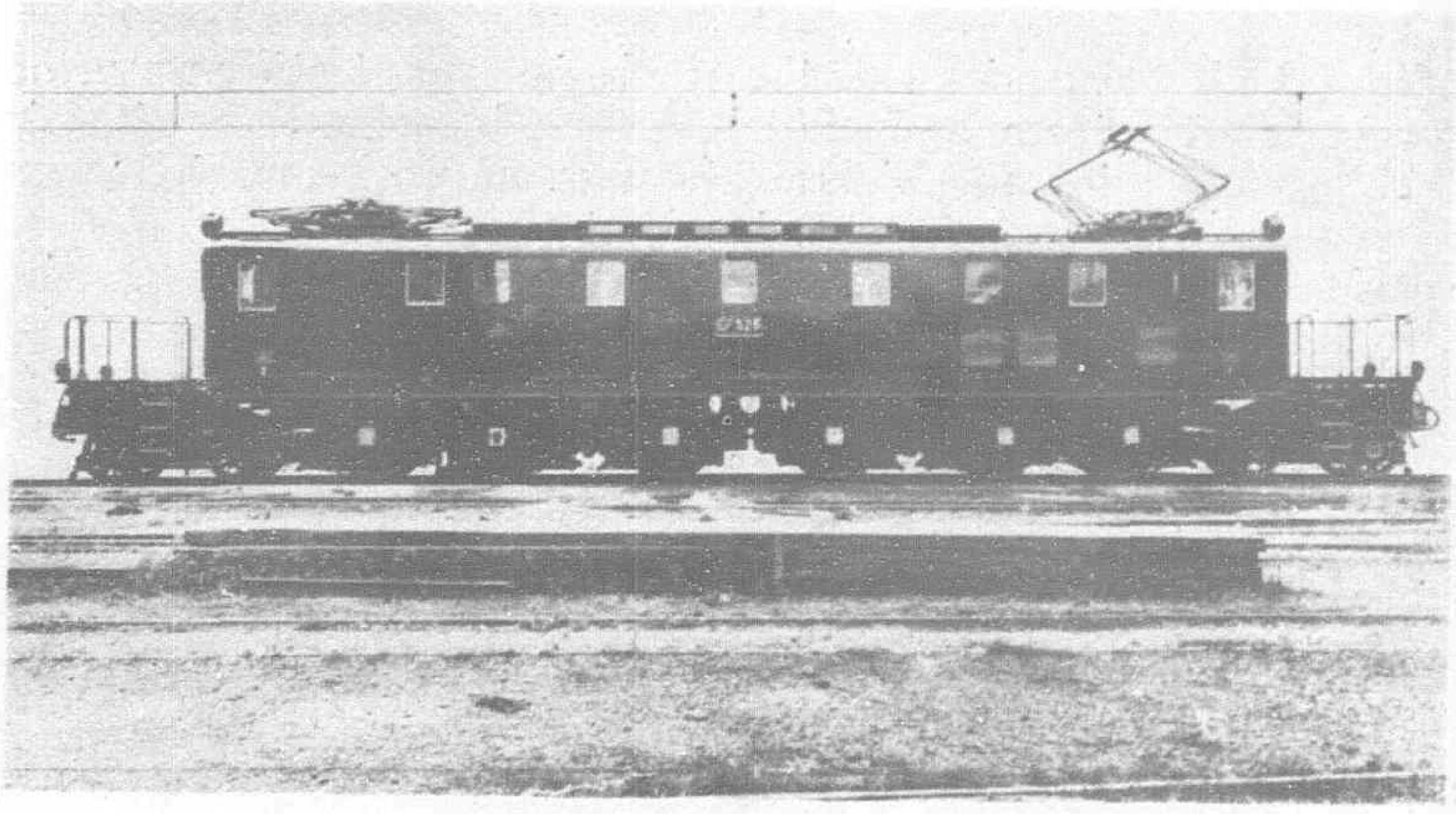


C 50 Type steam locomotive built at the Kobe Works for the Imperial Government Railways

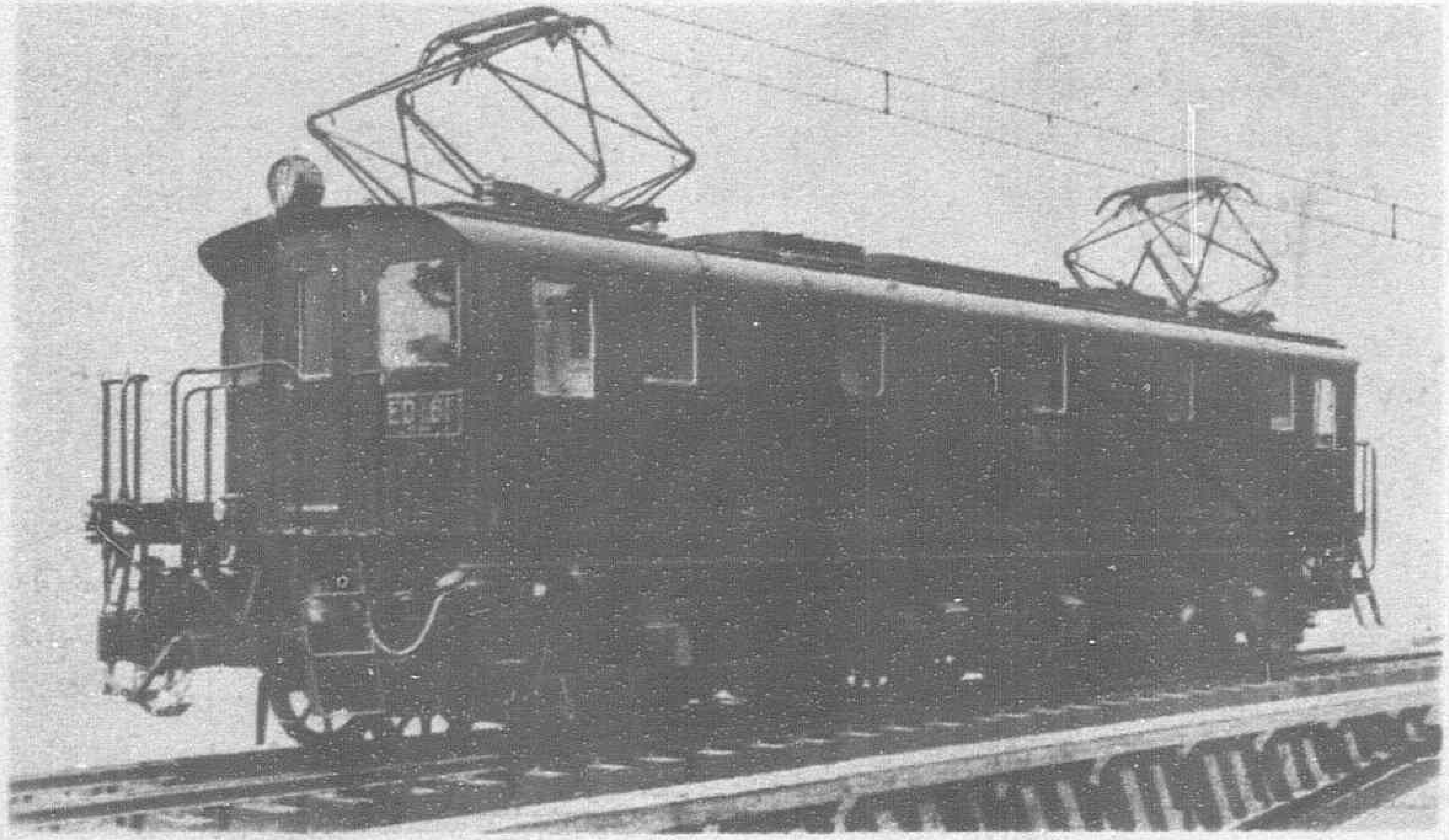


2

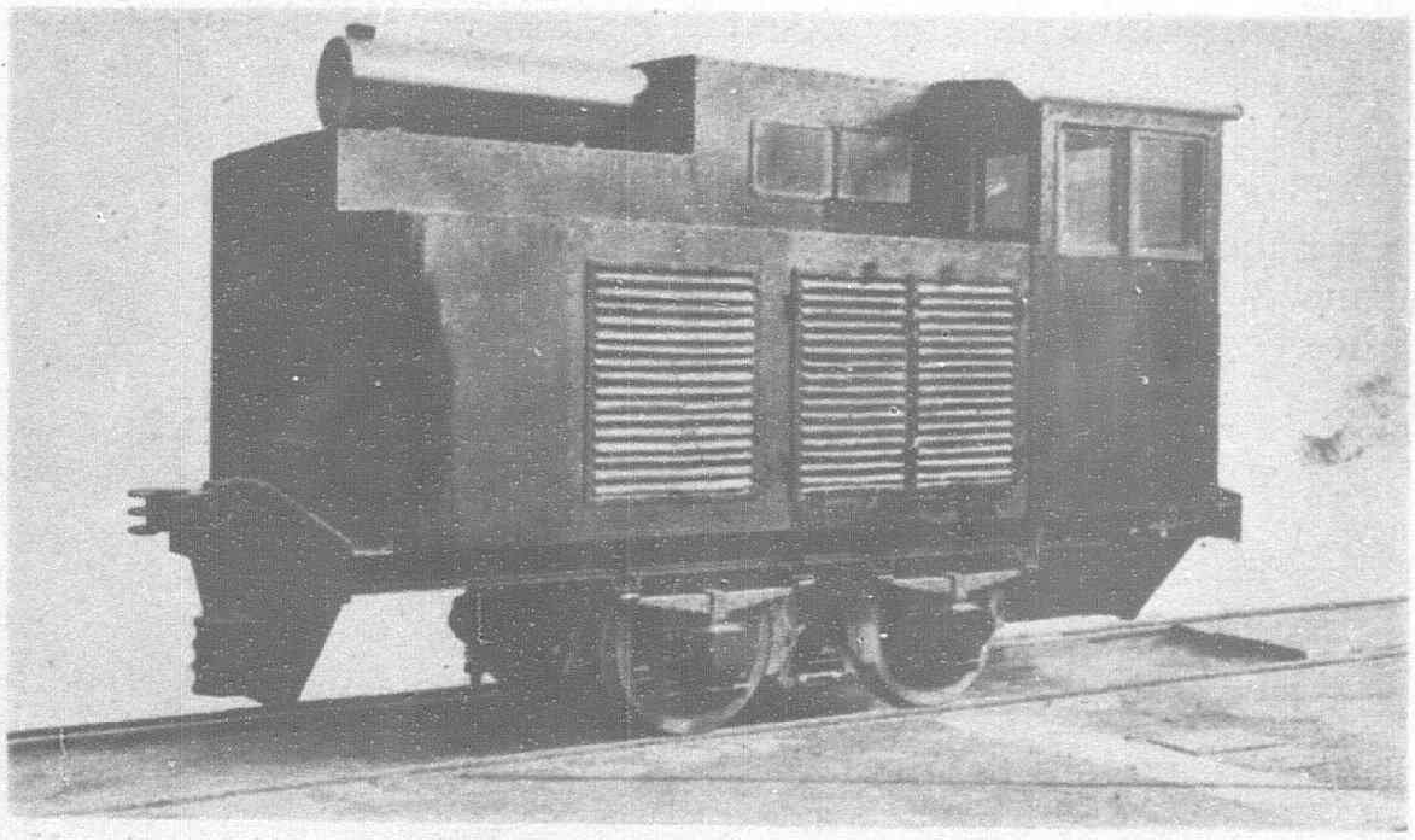
18,900 Type steam locomotive manufactured at the Kobe Works for the Imperial Government Railways



E F 52 Type electric locomotive built for the Imperial Government Railways



E D 16 Type electric locomotive manufactured at the Kobe Works for the Railway Department of the Imperial Government



8-ton Mitsubishi electric type Diesel locomotive

Japanese Navy and various steamship companies. It has recently been tried in steam locomotives, with excellent results.

Air Brakes

In these days of high-speed locomotion, it is mainly the brakes which prevent traffic accidents. That the various means of transport can operate at the highest speeds with safety may be said to be due to the provision of perfect air brakes. Amongst others, the Mitsubishi-Westinghouse automatic air brake is one of the most sensitive and exact in operation, and it can be recommended as the most superior kind of appliance to suit the requirements of the times.

Various types are produced for different requirements, such as for locomotives, passenger cars, freight cars and electric cars, but they are substantially the same in principle, and are capable of performing the function of braking and releasing with the utmost promptitute and accuracy. As this system is far in advance of the vacuum brake, a large number of air brakes have been furnished by the Works to the Imperial Japanese Government and private electric railway concerns.

Bridge Construction

Since the commencement of the manufacture in 1916 of bridge girders, the Works has been favored with numerous orders from the Imperial Government as well as from private railway companies, from the Reconstruction Bureau of the Home Department, various Prefectural Governments, and also from clients in Manchuria, Korea and Formosa, for bridge construction work. The Bascule type of bridges supplied to the order of the Kobe Municipality attracted much attention, being the first of their kind to be built in this country.

The Works pays special attention to the design and manufacture of bridge structures, and because of the splendid facilities it possesses, promised delivery dates can nearly always be anticipated.

Girders, Frame Structures and Posts

It is needless to remark that the closest attention is devoted to design and manufacture, and in order to ensure promptitude and accuracy of provisional erection and despatch, the Works has a transportable Goliath crane of a width of 180 feet, in addition to several locomotive cranes on its large assembling ground of about 4,000 tsubo. Reference should be made to the galvanizing process which was commenced with the establishment of the Works, and as a result of long experience and continuous research, a most satisfactory process of galvanizing has been evolved.

Besides rivetted posts, a new departure has recently been made in the manufacture of welded posts, which have met with great success. Being durable and economical to manufacture, it is confidently anticipated that these posts will in time replace the old wooden type.

Pipes

Both rivetted and welded water pipes are made at the Works, and electric welding has been a speciality there for many years. As early as the year 1914, a license was procured on the famous Oscar Kjellberg system of Sweden, by which the special processes were made available to the Company, and since 1915 this process has been worked.

The large waterworks extensions in big cities and towns contemplated these days specify long distance water pipes of big diameter, and from an economic point of view there is a marked indication that steel tubes are taking the place of cast iron. To meet these requirements, the Works has studied and perfected an anti-corrosive method, and is now producing a jute-wound steel tube, which, whilst being most durable, is moderate in price. It is less in weight and easier to lay than the cast iron tube, besides it possesses great strength against earthquake shocks and high pressure, and has the advantage of showing no sign of tube-buckle.

On the subject of welding, it should be mentioned that this Works is one of the very few welders approved by Lloyd's throughout the world and is with a sister Works at Nagasaki, the only one on the approved list in this country. The rivetless steamer *Suwa Maru*, built at the Nagasaki Works of this Company, was the first to be constructed in Japan on this electric welding system.

Mitsubishi Electric Winches

With the increasing tendency to electrify various auxiliaries in war and merchant vessels, the time has arrived for electric winches to displace the steam type. As a result of joint investigation with a sister concern, the Mitsubishi Electric Engineering Company Limited, the Works is producing an excellent electric winch on which patent protection has been secured. Some 200 of these winches have already been installed in vessels, and with a view to facilitating urgent needs, these winches have been standardized, as follows :—

Capacity. Tons.	*Speed Meters per min.*	*Revolutions of winch per min.*	*H.P. of electric motor*
2	36	520	23
3	30	450	28
3	36	500	33
5	40	420	57
5	24	350	40
5	18	250	40
6	18	250	40
7	18	250	40

Turbo-blowers

The Mitsubishi type of turbo-blower is the outcome of many years of experience and theoretical investigation. Its efficiency attains to 70-80 per cent, and it is an ideal apparatus as a gas compressor. Especially noise, which was considered to be a normal condition of turbo-blowers, has been considerably reduced, and vibration has been practically eliminated, with the result that there occurs no pulsatory motion in the air or gas. There is also no fear at all of oil mixing with the air or gas. This machine is easy and smooth in operation, and is capable of continuous running at very high speeds by coupling to a high speed motor or employing accelerating gear. The fuel consumption is small, and the price of the blowers is moderate. Many of these machines have been supplied to the Imperial Japanese Government Railways, to the Naval Arsenals, to the Tokyo and Osaka Gas Companies, the Nippon Chisso Hiryo Kaisha, etc., etc.

Lately this blower is being used also for scavenging purposes of Diesel engines.

Tokyo to Build Reservoir

The City of Tokyo will embark early next year on the construction of a Y.50,000,000 reservoir at the headwaters of the Tamagawa, capable of impounding 6,500,000,000 cubic feet of water, sufficient to supply the entire population of the proposed Greater Tokyo which is slated to embrace 82 towns and villages flanking the present city of Tokyo in the near future, subject to the approval of the city assembly.

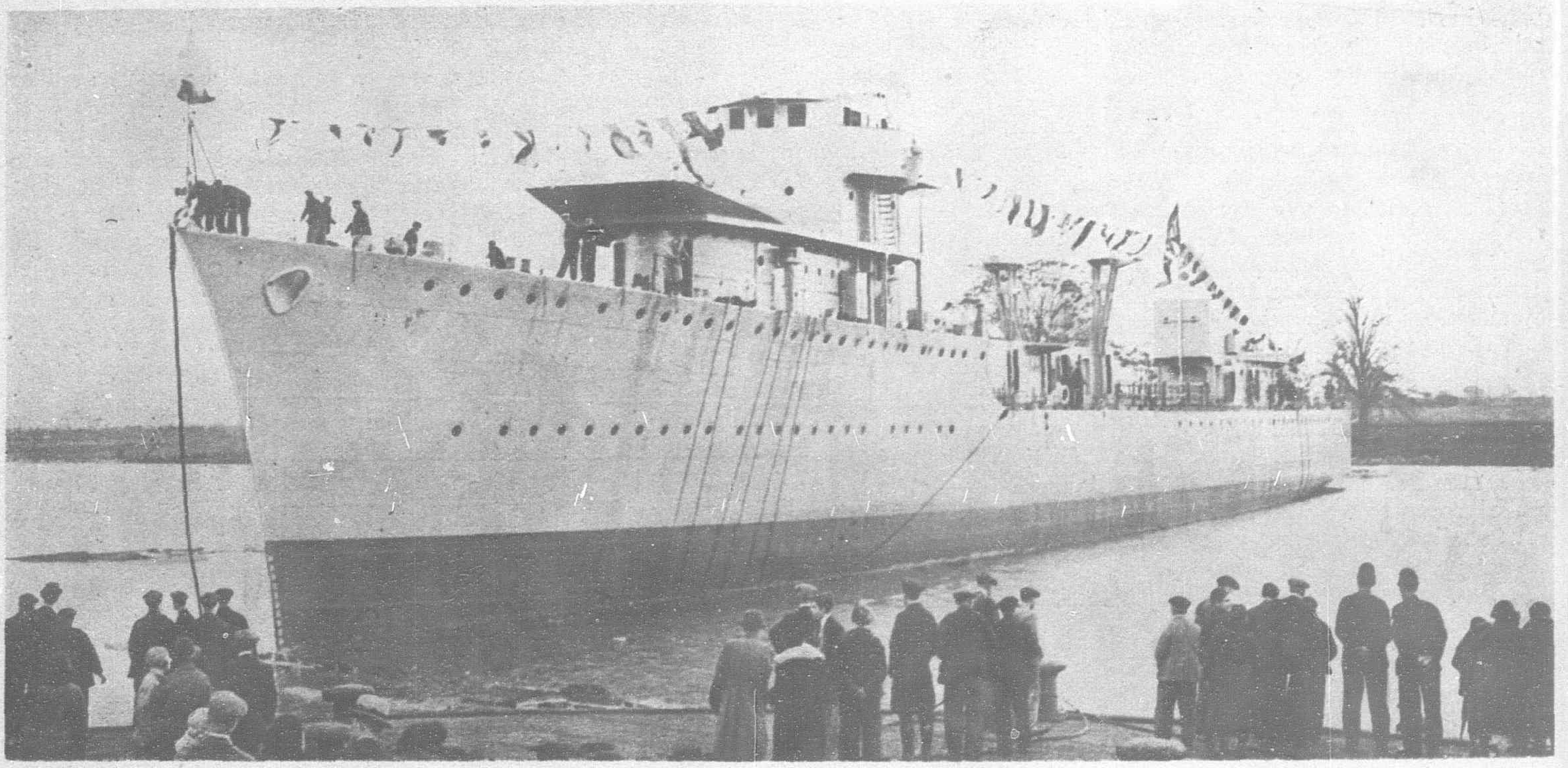
Mayor Nagata approved the basic plans drafted by Director Hara. The matter constitutes the City's third stage waterworks construction program and will be submitted to the City Assembly slated to convene during October.

The proposed reservoir is to be situated at Kogawachi-mura, Nishitama-gun, Tokyo Prefecture, being some 40 miles west of the center of Tokyo and just a few miles east of the Yamanashi Prefecture border.

The idea is to build a huge dam, 1,155 feet long, across the main stream of the Tamagawa, which has for some time been the City's source of water. Standing 450 feet high, it will rank third among the world's tallest dams. When the dam is completed the Tamagawa up to this point will be made into an artificial lake.

The construction work will be carried out on a 10 year program, at the total estimated cost of Y.49,200,000, of which Y.20,000,000 will be expended for buying the needed land, and the remainder for damming the stream and for building filters, aqueducts, and mains.

Inasmuch as the proposed artificial lake will alter the geographical aspects of the upper reaches of the Tamagawa, the City will alter the route of the present Prefectural highway leading to Yamanashi Prefecture *via* the Daibosatsu pass.



The Flotilla Leader "Dubrovnik"

Yarrow & Company Build Vessel For Yugoslav Government

THE Flotilla Leader *Dubrovnik*, which Messrs. Yarrow & Co. are constructing for the Royal Yugoslav Government, is a most modern high speed vessel 371-ft. 6-in. length overall, 35-ft. 0-in. breadth moulded and 22-ft. 9-in. depth moulded. Its hull has been specially designed with a view to securing the greatest possible combination of strength, speed and manoeuvring power, together with good sea-going qualities. The bow is of improved form, with a raised forecastle and good flare forward. Experience has shown this form of bow to give the best results as regards seaworthiness and fighting qualities in a head sea. The stern, of the special flat type developed by Yarrow & Co. for high speed, is of sufficient width to protect the propellers when coming alongside, and the rudder is below the water line for protection from shot. High tensile steel is used for all parts of the hull upon which longitudinal strength depends and the whole construction is in accordance with latest up-to-date naval practice.

The armament comprises four 5.5-in. breach loading guns, anti-aircraft guns and two triple 21-in. torpedo tubes. A very complete electrical installation is provided, with wireless and fire control.

The vessel is twin screw and propelled by geared turbines. Each set consists of a high pressure and a low pressure turbine driving, through pinions, a gear wheel mounted on the propeller shaft. Special cruising turbines are coupled through a clutch to each h.p. turbine and ensure maximum economy at low cruising speeds. The astern turbines are incorporated in the low pressure cylinders. The main engines will develop sufficient power to give the vessel a speed of 37 knots. A very complete equipment of auxiliary machinery is installed in accordance with first class naval practice.

A feature of the vessel is the boiler plant consisting of three Yarrow Patent Water-Tube Boilers arranged for oil firing. Each boiler is situated in a separate stokehold and is capable of being worked independently. Yarrow Superheaters and Yarrow Air-beaters are arranged in conjunction with the boilers which will return high efficiencies for cruising and be capable of heavy forcing.

The accommodation is roomy, comfortable and well ventilated.

This Flotilla Leader is the largest and most powerful of its kind ever built in this country for the British or any other Navy and represents a radical advance on anything hitherto accomplished for this class of service.

Arc-Welding in Japan

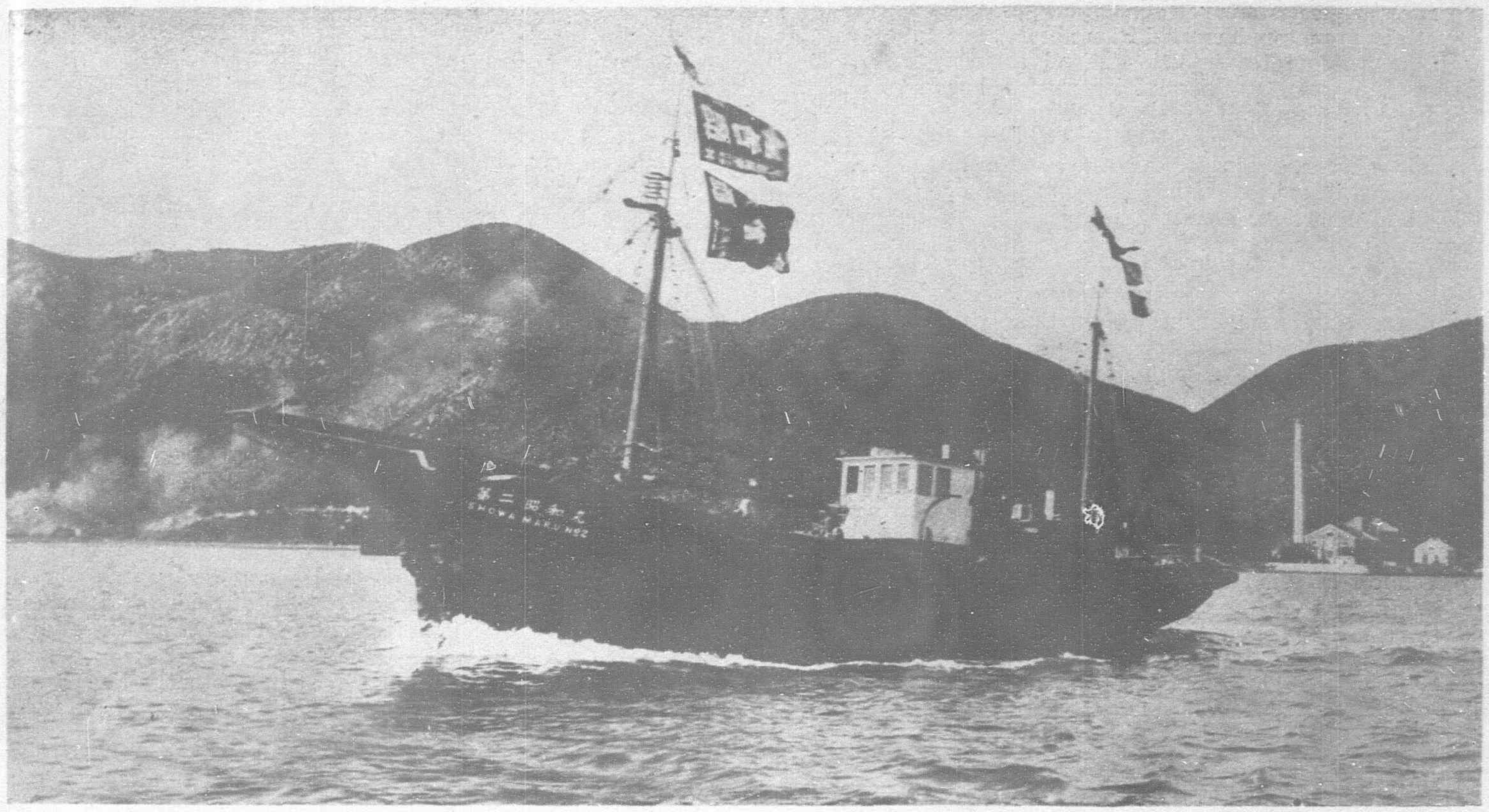
(Continued from page 44)

The installation of two tractors for use with the Electronic Tornado process of automatic welding occupied much of the writer's time while in the employ of the Kawasaki Dockyard Co. at Kobe. These tractors are used in the manufacture of large-diameter water pipe for the new Tokyo water supply system, and the setup is the same as that used in American pipe factories.

The pipe is made in three diameters, 1.3, 1.5 and 2.1 meters. The sections are composed of two plates rolled and fused together with a double pass, one pass on each side of the seam. In spite of the low-carbon steel used for these pipes (0.8-0.10 carbon content) test samples pulled at over 70,000 lbs. per sq. in. and several coupons pulled at 80,000 lbs. per sq. in. The ductility of this weld metal was better than that of the plate.

This pipe is flanged hot in a heavy press, and tested, after flanging, at 250 lbs. hydrostatic pressure. In the field the sections are tied together with welds on both the inside and outside of the pipe. Seven beads are required on the inner seam, and as this is done with Japanese electrodes and machines, much of the overhead welding is very difficult. It is safe to assume, however, that heavily coated American electrodes will be used for this work as soon as machines can be supplied with enough amperage to insure penetration.

The Japanese are extremely "welding conscious." Even with a society which is not well adapted to our industrial high-pressure methods, they are bound to gain the greatest efficiencies from welding. So far they are hampered by much obsolete or inefficient equipment, but this situation will not be allowed to exist for long. The Japanese are ten years ahead of us in their enthusiasm and belief in welding; ten years behind in quipment and method; but the first condition will solve the latter.



The motor bonito fishing boat "Showa Maru No. 2"

Recent Development of Fisheries Motor Craft in Japan

By *Y. TAJI, M.I.N.A., M.I.Mar.E.*

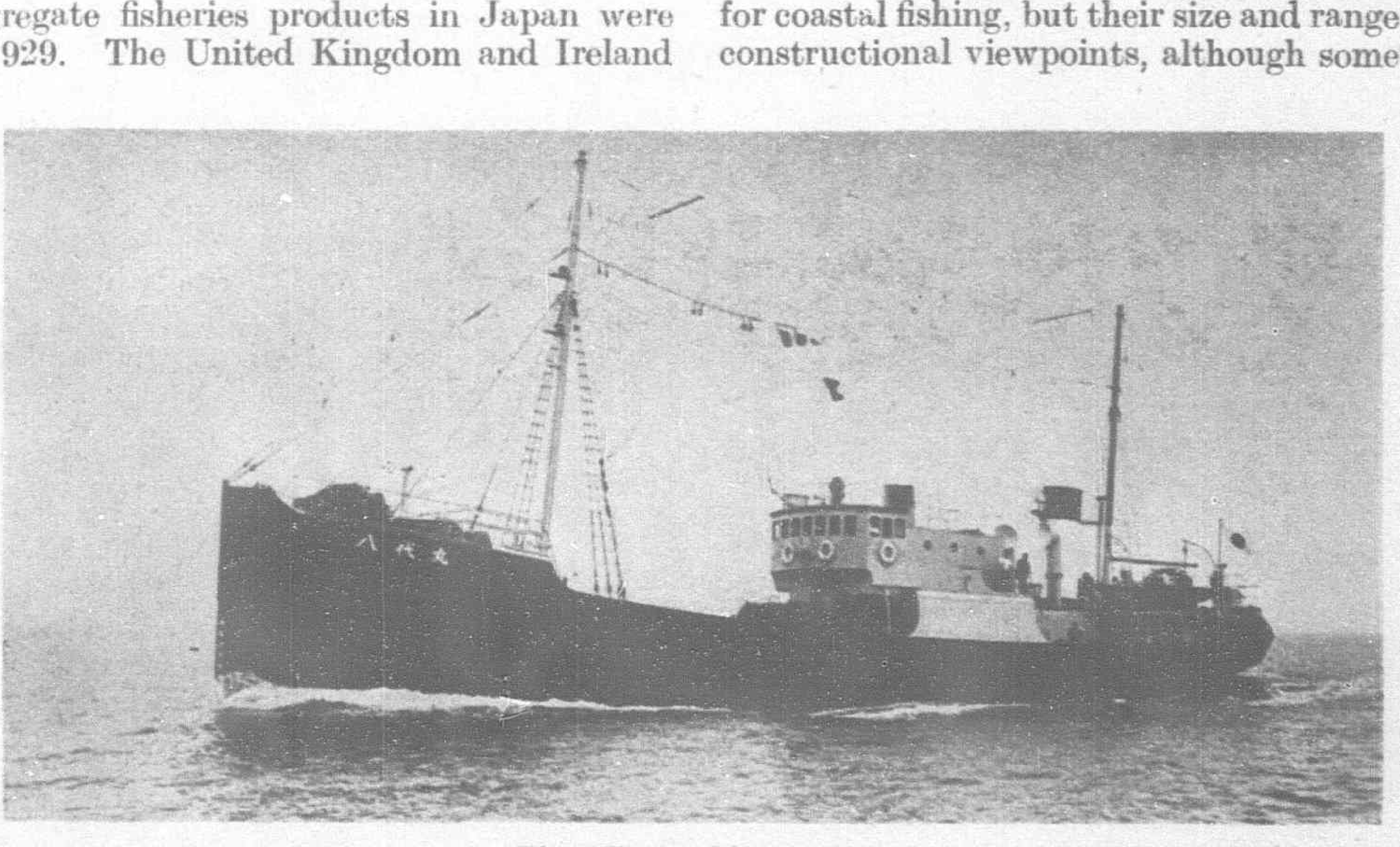
JAPAN is not greatly blessed with natural land resources, but with her long coast lines extending to the tropics from a frigid zone, the inexhaustible marine products of the Pacific Ocean, and the traditional skill of native fishermen together with the strenuous scientific research relating to acquatic products and the rapid, yet steadfast development of Diesel-motor fisheries ships have rendered the fisheries industry to be ranked as the greatest in the world, so far as the output is concerned.

Statistically, the aggregate fisheries products in Japan were about 3,000,000 tons in 1929. The United Kingdom and Ireland come next, their total having been about 1,500,000 tons, but in comparing the production per fishing boat or per head of fishermen of both the countries, Japan is far behind Great Britain.

This emphasizes the necessity of further improvement in fishing methods and efficiency. Under such circumstances, the recent rapidd evelopment in the Diesel-motor fishing craft is a natural trend. Very recently, the reinforcement of the national policy for the fisheries industry has been strongly advised in both political and industrial circles in Japan to whip the Government authorities to take special steps for the further development of this industry.

It is, however, a remarkable fact that the improvement of fishing boats during the last twenty years has been achieved not only by shipbuilders and engineers, but also by the aid of fishermen of progressive and enterprising spirit as well as by the Deep Sea Fisheries Encouragement Act.

Japanese junks are very handy and inexpensive and suitable for coastal fishing, but their size and range of action are limited from constructional viewpoints, although sometimes they are over 50-ft. by 4-ft. 6 in. Consequently, European types with internal combustion engines have been necessary for distant fishing from home ports. The first adoption of this type caused great anxiety among fishermen in consideration that such a boat might roll heavily and not be suitable for fishing operations or the sound of the motor and the odor of fuel oil might drive the fish away, but it was decisively proved by experience that these were vain anxieties.

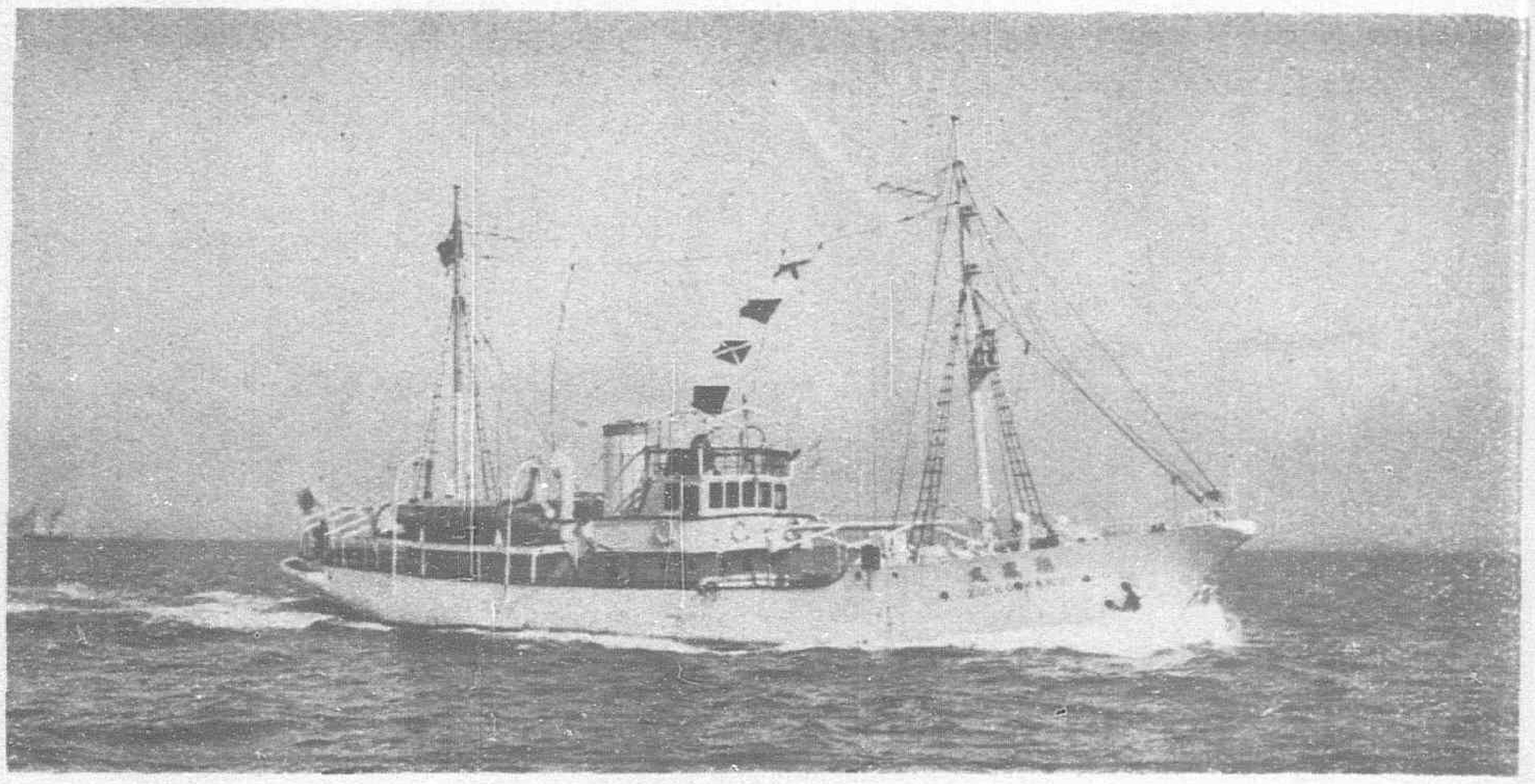


The "Yatsushiro Maru"

Earlier engines were petrol, suction gas, hot bulb petroleum motors imported from abroad, but now home-made airless injection Diesel engines and hot-bulb waterless Diesel engines for low power have been generally adopted. The fishing grounds have also been considerably extended to the Bonin Islands, Formosa, China Sea and even to the South Seas, and the total amount of catches has now been increased by some seven times of that of twenty years ago.

This long distance fishing necessitates a low fuel consumption, a large refrigerating capacity and a larger displacement in conjunction with speed. Under such conditions, the Diesel engine is doubtless most suitable for these classes of vessels.

The latest Japanese fishing craft of this class has a gross tonnage of over 350 tons, a Diesel engine of over 700 b.h.p. with a speed of over 12 knots and a navigation radius of over 11,000 nautical miles.

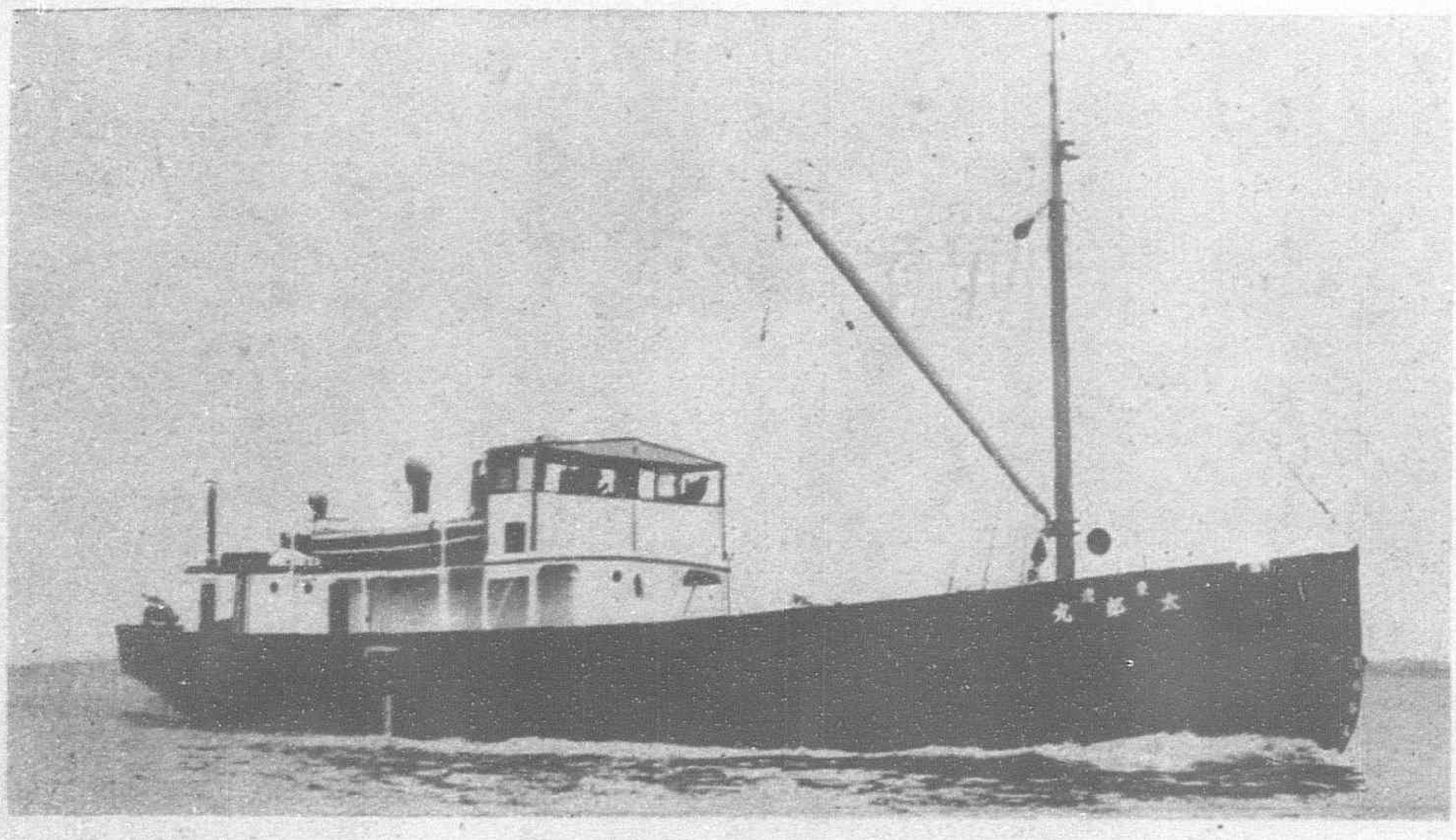


The "Zuiko Maru"

Trawlers operated on proclaimed areas off the Coasts of Japan have been restricted in number and tonnage (not more than 70 ships and 100 gross tons each) under Government Regulations in order to protect the coastal fishermen and also from the zoological consideration. For larger trawlers operated outside the coastal area of Japan proper, it has been specified in design that maximum hull stresses under the specified calculation should be less than 2.4 tons per sq. in., the freeboard not less than 1-ft. 8-in. at full loaded condition, the metacentric height and range of stability should not be less than 1-ft. and 60 degrees respectively at any condition.

Recent designs of large trawlers will be seen from the following table :—

Name of Ship		*Kushiro Maru*	*Keiman Maru*	*Yuki Maru*	*Yatsushiro Maru*
Length b.p.	(L)	135′-0″	135′-0″	135′-0″	145′-0″
Breadth mld.	(B)	24′-0″	24′-0″	24′-0″	24′-0″
Depth mld.	(D)	13′-6″	13′-6″	13′-6″	14′-0″
Proportion	L/B	5.63	5.63	5.63	6.08
,,	L/D	10.00	10.00	10.00	10.04
,,	B/D	1.78	1.78	1.78	1.71
Gross Tonnage		312.0	317	326	362
Fish Hold Capacity, cub. ft. ..		6,870	8,525	9,747	9,270
Fuel Oil ,, , tons ..		124	155	77	116
Main Engine Type, Normal Power		Diesel 750 b.h.p.	Steam E. 800 i.h.p.	Diesel 550 b.h.p.	Diesel 550 b.h.p.
Trial Speed, knots		11.8	11.6	12.2	12.78
Radius of Navigation, Naut. Miles		10,000	5,000	7,000	11,300
Travel Winch		50 h.p. elec. motor	9″×13″ steam	Driven by 110 b.h.p. Diesel Engine*	75 h.p. elec. motor
Refrigerating Capacity, Tons per day		8.0	$8\frac{1}{2}$	18.0	25.0
Remarks				*in Engine Rm. thro belt, shaft and gears	



The "Towan Taro Maru"

Prefectural Governments having large fishing centers have also built many fishing fleet leaders or guards for the exploration of fishing zones, supervision of fishing, researches for local marine products, improvement of fishing methods, salvage and the like.

The Imperial Fisheries Institute has recently built a large fisheries training and investigation ship *Hakuyo Maru* for the general improvement of Japanese fisheries, as described specially in the last chapter of this article.

The speed of the fishing craft is very important in manœuvering the ship and in chasing shoals and to return to port as quickly as possible in order to sell the catches at the best price. At the same time, it is also necessary to have special means for quick and economical transportation of the fresh catches to the central markets such as Tokyo and Osaka. For this purpose, some special motor fish-carriers have been built to be operated between fishing ports and central markets.

The writer describes hereafter some typical and most up-to-date vessels built very recently in Japan.

(I). Motor Trawlers. The "Yatsushiro Maru" and Class

The motor trawler *Yatsushiro Maru* and her five sister ships are the largest and latest fishing craft of this type in Japan. Their performance was keenly observed by both shipbuilders and fisheries circles, and the results have given great satisfaction to them.

The names of the vessels are the *Yatsushiro Maru*, *Mamiya Maru*, *Teshiwo Maru*, *Azuchi Maru*, *Sapporo Maru* and *Kitami Maru*, all having been built in the Mitsubishi Hikoshima Dockyard to the order of the Kyodo Gyogyoh K.K. (The Associated Fisheries Company, Ltd.) of Shimonoseki.

The first ship *Yatsushiro Maru* was laid down on March 27, 1930, launched on May 31 and completed on July 15, 1930. The second, third, fourth and fifth ships were completed in order, and the sixth ship was laid down on September 9, 1930, launched on November 8 and completed on December 15, 1930.

All vessels being of the same design, the following description is given for the *Yatsushiro Maru* representing the others :—

THE LEADING PARTICULARS

Length b.h.p.	145′-0″
Breadth mld.	24′-0″
Depth mld.	14′-0″
Gross tonnage	360 tons.
Speed (trial)	12.78 knots.

Engines :—One "Niigata-Nobel" two cycle trunk-piston Diesel engine, with normal output of 550 b.h.p.

Fish hold capacity	9,270 cub. ft.
Refrigerating room :	916 cub. ft.

The ship's model was tested in the Nagasaki Mitsubishi Experimental Tank, and the vessels are classified by the Japanese Government as "the First Class Ocean-Fisheries Motorship."

General Arrangement.—The vessel is a single decker with a low forecastle and below the upper deck is subdivided into a forward peak tank, a fresh water tank (chain lockers and boatswain's stores over), a large fish hold, fuel oil tanks, an engine room and engineers' and oilers' quarters (aft peak tank below). On the upper deck, a crew space, a lamp room and lavatory are arranged under the forecastle deck; over the fish hold are center rollers, a side roller and an electric trawling winch and large fish ponds at sides. Adjacent to the engine room casing is a spacious freezing chamber and a preparation room at port side. Abaft the engine room casing are a galley, an officers' mess, a crew's mess, while a bath-room, lavatory, etc., are provided at the stern.

On the bridge deck amidships, a wheel house, a captain's room, a wireless telegraphy room, a chief mate's room and a chief engineer's room are arranged.

All necessary equipment for the living quarters, such as electric lamps, oil lamps, fans, heating and ventilating appliances are complete.

Fishing and Refrigerating Appliances.—The vessel has a pair of gallows at starboard side only, as Japanese fishermen do not consider that both sides gallows are necessary. The electric trawl winch is driven by a 57 h.p. motor, entirely designed and built in Japan and matches that of the Laurence-Scott's latest design in mechanism and operation. All necessary rollers, such as center rollers, side rollers, messenger rollers, quarter rollers, etc., are fitted complete.

The extraordinary capacity of the fish hold is also a speciality of the vessel in accordance with gradually increasing distance of fishing centers from home ports. The fish hold extends over about half the length of the ship, occupying a space of 9,270 cub. ft. and is subdivided into 24 rooms with complete heat insulation, so that the vessel may also be utilized as a fish carrier, whenever it is necessary.

The ammonia compression direct cooling system is adopted and for that two 19 R.T. vertical closed single acting compound cylinder ammonia compressors of American Vilter & Co., driven by a 50 h.p. D.C. compound wound electric motor are provided. The condenser is also of Vilter's cylindrical multi-tube type with a cooling surface of 172 sq. ft. and a capacity of 22 R.T., whilst the brine cooler is of the same type with a cooling surface of 218 sq. ft. and a capacity of 20 R.T.

Further, electric driven cooling water pumps and brine pumps are provided. Utilizing the excess capacity of the machines, the refrigeration is carried out, the volume of the refrigerating room being 916 cub. ft.

Main and Auxiliary Machinery.—The main propelling machinery is a Niigata-Nobel two-cycle trunk piston four cylinder Diesel engine with a normal output of 550 b.h.p. at 190 r.p.m., the bore of cylinders being 380 mm. and stroke 610 mm. There are one double acting scavenging air pump, one three stage tandem air compressor, one bilge pump, one cooling water pump, one piston cooling water pump and one lubricating oil pump, all being directly driven by the main engine. Further, one starting air bottle, two injection air bottles, one lubricating oil cooler, one piston cooling fresh water cooler, etc., are provided.

The electric generating plant comprises one 75 kw. generator directly coupled to a 110 b.h.p. Diesel engine, one 12 kw. dynamo driven by a 20 b.h.p. Diesel engine and one 5 kw. dynamo driven by belt from the intermediate shaft of the main engine. The 75 kw. and 12 kw. generators supply current mainly to the trawl winch and windlass respectively, and also to electric pumps and other auxiliaries. The 5 kw. dynamo is for electric lighting. There is a 50 h.p. electric motor driving an auxiliary compressor and two ammonia compressors by means of belts, clutches and hand gears being fitted in order to operate either one machine or three together. The lubricating oil purifier is of Sharple's type driven by an electric motor of one h.p.

Electric pumps are as follows :—

Combined brine and cooling water pumps directly coupled to a 1.5 h.p. electric motor at both ends.

A wash deck pump, an auxiliary piston cooling water pump and an auxiliary lubricating oil pump, driven by a 1.4 h.p. motor.

A heating water pump with a 1.1 h.p. motor.

A bilge and ballast water pump directly coupled to a 1.2 h.p. motor and a belt driven fuel oil transfer pump.

Trial Results.—The results of official trials of these vessels were very satisfactory as shown below :—

Name of Ships	*Yatsushiro Maru*	*Mamiya Maru*	*Teshiwo Maru*	*Azuchi Maru*	*Sapporo Maru*	*Kirami Maru*
Draught (mean) ..	10'-0¾"					
Displacement, tons ..	495.7	505	506.5	501	506.5	504
Speed, knots ..	11.82	12.20	11.77	12.78	12.56	12.56
R.P.M.	209.6	212.8	214.85	229.85	227.8	226.9
I.H.P.	826.5	849.24	853.65	899.0	982.3	1,021.14
B.H.P.	610	624	623	666	722	732.3

(II). Line Fishing and Special Fisheries Motorships

(A). Bonito Fishing Boats.—These are very popular fishing boats extensively used for coastal fishing in Japan.

The bonito is a fish of fifteen to thirty inches in length, moving in shoals in warm currents. They are chiefly caught by the rod, though drift nets or purse seines are sometimes used. The boat should have sufficient stability and should be steady in a seaway, for a great number of men stand side by side on the sponson built outside of the bulwark at one side of the boat when fishing. The boat should have fish wells for live sardines, which should necessarily be used as bait though imitated bait might be used with it in the middle of fishing. The boat should have good speed and quick manœuvering quality, in order to find and chase the best shoals as they are very quick fishes and to return to the port quickly in order to sell the catches at the best price.

The bonito is not only cooked when fresh, by boiling and it is preserved by smoking and drying when it is suitable for storage, but it is universally used as a condiment known as "Katsuobushi." There is no limit to the demand for "Katsuobushi" in Japan, because it is essential as seasoning for soup and other Japanese cooking.

There are many fishing motor craft of this type. For the latest and typical example, particulars of the *Showa Maru No. 2* are given below :—

The "Showa Maru No. 2"

Shipbuilders :—The Harima Dock Co., Ltd.
Date of Completion :—January 18, 1930.

Length b.p.	80'-0"
Breadth	19'-0"
Depth	9'-0"
Draught	7'-0⅝"
Gross tonnage	109.34 tons.
Net tonnage	39.16 ,,
Dead weight	85.3 ,,
Displacement	199.0 ,,
Trial speed	9.33 knots.
Trial power	251.5 b.h.p. at 397 r.p.m.

Main Engine :—One set of "Niigata" four cycle airless injection Diesel engine with six cylinders of 250 mm. bore and 380 mm. stroke, normal output being 225 b.h.p. at 380 r.p.m.

Fuel consumption—136.5 grams per b.h.p. per hour at full load. 124.3 gm./b.h.p./hr. at ½ load.

Auxiliary Machinery :—

1—Cooling water pump directly coupled to the main engine.
1—Bilge pump directly coupled to the main engine.
1—Lubricating oil pump directly coupled to the main engine.
1—Auxiliary air compressor driven by a gasoline engine.
1—Spray water rotary pump.
1—15 kw. D.C. dynamo for lighting.
2—D.C. dynamos of .75 and .3 kw. for wireless installation, driven by a 5 h.p. gasoline engine.

Propeller :—Solid manganese bronze, diam. 1,460 mm., pitch 840 mm. and developed area 5,750 sq. cm.

Number of crew :—About 70.

Tank capacities :—Fuel oil tanks about 15 tons, fresh water tank about seven tons.

Fish wells :—About 1,200 cub. ft.

Ice stores :—About 18 tons.

(B). The Prefectural Fisheries Leader "Fusa Maru".—The vessel was built in the Mitsubishi Hikoshima Dockyard to the order of the Chiba Prefecture in April, 1929, and is used for the bonito and tunny fishing, and for the exploration and experiment of fishing as well as for the training of cadets of the Awa Fisheries School.

The principal particulars are as follows :—

Length b.p.	105′-0″
Breadth mld.	22′-3″
Depth mld.	10′-3″
Gross tonnage	176.6 tons.
Speed	11.79 knots
Main engine :—One set of the Ikegai four cycle airless injection single acting Diesel engine.	
Normal output	320 b.h.p.
Classification :—The First Class Fishing Craft.	

General Arrangement.—The vessel is a single decked two masted fore and aft schooner with a Diesel engine for the main propulsion, and has a clipper stem and a low forecastle.

Crew's and cadets' quarters are arranged under the forecastle, and in front of the engine room are ice fish hold and living fish wells. Abaft the engine room, officers' accommodations are provided. In the deck house amidships are a captain's room and a wireless telegraphy room situated in front of the engine room casing, whilst an investigation room, a galley, bath and lavatory are abaft the casing.

Exposed decks are planked with teak and inside linings of the rooms are of polished oak.

Further, a searchlight, an electric sounding machine, a wireless direction finder, wireless telegraphy and telephony apparatus, a 20-ft.—6 knot motor-boat, etc., are provided.

Fishing Appliances.—At port bow and around the stern, bonito fishing platforms and spraying hoses are provided. An electric line hauler is installed at the forward port side on the upper deck.

The fish well at the front of the engine room is subdivided into two compartments, each having a capacity of 11.3 tons at full load and fitted with eight sea-valves operated by handles on the upper deck.

The ice hold comprises six rooms and has a capacity of 981 cub. ft. The cooling is effected by ammonia compression direct expansion system, for that a York's vertical single acting closed type Y-26 high speed ammonia compressor of two tons capacity driven by a 5 h.p. D.C. shunt motor is installed in the engine room together with a receiver, a cooling water pump, an ammonia condenser, an oil separator, etc.

Main and Auxiliary Machinery.—The main propelling machinery is the "Ikegai" four cycle single acting airless injection Diesel engine with six cylinders, developing 320 b.h.p. at 320 r.p.m.

The electric generating plant comprises one set of 15 kw. D.C. dynamo driven by belt from the main engine shaft.

Auxiliaries are as follows :—

(*a*) An air compressor and a combined fire, bilge and sea water pump, driven independently through gearings at ends of a 5 h.p. electric motor.

(*b*) A centrifugal oil fuel transfer pump and a fresh water pump, driven independently through clutches coupled to the ends of a 3 h.p. electric motor.

(*c*) A hand air compressor, two main starting air bottles, electric accumulators, etc.

TRIAL RESULT

Mean draught	6′-11″
Corresponding displacement	210 tons.
Speed (mean)	11.79 knots.
R. P. M. (mean)	354
B. H. P.	428.7

(C). The Fishing Guard "Zuiho Maru".—The *Zuiho Maru* is a special service vessel of the South Sea Government, built for the fishing of bonitoes, tunnies, etc., in the South Seas and for the exploration of fishing as well as for salvage purposes.

The vessel was laid down in the Mitsubishi Hikoshima Dockyard on September 22, 1930, launched on December 20, 1930, completed on January 31, 1931 and sailed for the South Seas at the end of February, 1931. She was built under the supervision of officials of the Japanese Bureau of Fisheries and of the South Sea Government, and has the most up-to-date equipment for the purpose.

The leading particulars are as follows :—

Length b.p.	110′-0″
Breadth mld.	23′-0″
Depth mld.	10′-6″
Gross Tonnage	184.54 tons.
Maximum Speed	11.54 knots.

Propelling Machinery :—One set of the Mitsubishi-Vickers four cycle single acting airless injection Diesel engines with normal output of 320-360 b.h.p. at 260 r.p.m.

Classification :—"The First Class Ocean Fishing Vessel" by the Japanese Government.

General Arrangement and Hull Construction.—The vessel is a steel sailing ship with a low forecastle and single deck, installed with a Diesel engine for the main propulsion, and has a clipper stem with fashion plate. The rigging is of the two masted fore and aft schooner.

Between the crew space and the engine room are a fishing gear store, cold stores, fish wells, etc. Officers' rooms are arranged abaft the engine room. On the deck house amidships are a Captain's room and investigation room on the front of the engine casing, and on the aft are a wireless telegraphy room, a galley, a bath-room, lavatory, etc.

In view of difficulty for docking and repair in the South Seas districts, the entire bottom plating under L.W.L., the inside surfaces of the fish wells, floors and coamings of the lavatories, bath-rooms, galley, etc., are galvanized to protect from corrosion.

All exposed parts of decks are planked with teak, while floors of living rooms are covered with deck composition and interior walls are neatly panelled with polished oak. To suit tropical navigation, exposed outside steel plating of deck houses is lined with cork plates of 5 mm. thickness.

The vessel is equipped with a searchlight, an electrie sounding machine, a wireless direction finder, a complete set of wireless telegraphy and telephony apparatus with 120 amp.-hour and 110-volt accumulators, a 6 meter - 7 knot motor-boat, etc.

A powerful electric windlass is installed on the forecastle deck and an electric line hauler on the forward upper deck.

Fishing Equipments.—A bonito fishing platform is arranged at stern and fish wells on the front of the engine room, whilst water spraying pipes are fitted at bow and stern.

The fish wells are two in number, each having a capacity of 11 tons, and being provided with ten sea valves operated from the upper deck.

As to rope hauling devices, a 2.25 kw. electric line hauler is installed on the upper deck with three rollers on bulwarks.

The cold store comprises three chambers and has a capacity of 28 cub. meters for 8,000 kgs. of fresh fish. The cooling and refrigeration are effected by ammonia compression and direct expansion system, for that a Frick's electric driven self-contained single acting closed ammonia compressor together with a cooling water pump, ammonia receivers, etc., are installed in the engine room, the cooling capacity being 150,000 calories in 24 hours.

Main Engine and Auxiliaries.—The main propelling machinery is a Mitsubishi-Vickers six cylinder four cycle airless injection Diesel engine with normal output of 320-360 b.h.p. at 280 r.p.m.

The distribution of fuel to the cylinders is executed by fuel valves mechanically operated by cams, whilst fuel pumps serve only to deliver fuel oil to a common pressure oil main ; consequently the adjustment of the output of each fuel oil pump is not necessarily uniform, and in case of trouble at a certain cylinder, the rest of cylinders can conveniently develop their maximum output.

The fuel injection being carried out under a constant pressure throughout the duration from starting to stopping and being independent to load and revolutions, the slow speed navigation is easy and sure. This is very important in the hauling operation, yet not the slightest sign of smoke has been witnessed at such a slow speed. The lowest revolution was recorded as 85 per min. on the low power trial. The same smokeless condition was observed in the full power trial developing 420 b.h.p. and the whole performance was very satisfactory.

Special care was taken for the prevention of vibration of the engine, which is very important for the fishing craft. Cranks and six moving parts were perfectly balanced, whilst six cylinders and the closed crank chamber being firmly bolted together as to form a solid body, the resistance against vibration is extremely strong. The torsional vibration of the shafting is also ingeneously avoided in any speed under careful design in determination of its dimensions.

Special care was also taken for the consumption of lubricating oil and special patent oil wiping piston rings being used, the consumption has been only 1½ grams per b.h.p.

In order to supply electric power to the various machinery, one set of 15 kw. generator driven by a 33 b.h.p. four cycle two cylinder airless injection Diesel engine and a 5 kw. generator with a 10 b.h.p. vertical petroleum engine are installed in the engine room. There are a "Tyfon" whistle and a 3 h.p. motor siren.

Trial Results.—The official full power trial, progressive trial, seven hour continuous running trial, tests for fishing appliances, refrigerating machinery, etc., were carried out under supervision of government officials and the entire results were very satisfactory.

The result of the official full power trial is as follows :—

Date :—January 26, 1931.
Weather :—Cloudy.
Sea :—Calm.
Mean draught :—7′-4½″
Corresponding displacement :—228.8 tons.
Mean Speed :—11.54 knots.

R.P.M.	296
B.H.P.	353.70
I.H.P.	441.70
Slip, %	12.59
Mechanical efficiency, %	80

(III). Motor Fish-carriers

The development of the motor fishing craft has necessitated the construction of many modern motor fish-carriers which transport fresh fish from fishing ports to central markets such as Tokyo and Osaka as quickly as possible.

The Tokyo-wan Kisen Kaisha (the Tokyo Bay Steamship Company, Ltd.) placed an order for building six up-to-date motor fish-carriers to the Fujinagata Shipyard, Ltd. of Osaka at the end of last year, and now all of them have been completed. The ships are named the *Towan Taro Maru, Towan Jiro Maru, Towan Sabro Maru, Towan Goro Maru* and *Towan Rokuro Maru*, which mean "the First Son of Tokyo Bay" to "the Sixth Son of Tokyo Bay."

The first two ships are of the same design, whilst the remaining four are of another uniform design.

(A). The "Towan Taro Maru" and "Jiro Maru."—These vessels are operated between Shimoda, a fishing port at the extreme end of Idzu Peninsula, and Tokyo City.

The principal particulars are as follows :—

Length b.p.	80′-0″
Breadth mld.	17′-0″
Depth to upper deck	7′-9″
Gross tonnage	73.81 tons.

Fish Hold capacity.—400 fish barrels of 23″ diam. × 21″ high. *i.e.* about 32½ tons.

Engine.—One set of Ikegai airless injection Diesel engine with normal output of 150 b.h.p.

Speed.—About 9 knots.

The vessels are classified by the Government as "Third class Coast-service Cargo Boats."

General Arrangement.—The vessels are designed for the carriage of fishes and have a single deck, a funnel and single propeller. An engine room is arranged aft, while forward is a very spacious cargo fish hold subdivided by a temporary transverse bulkhead into two holds. On the upper deck are a captain's room and a wheel-house in front of the engine casing, while the aft part is utilized for a crew space, a galley, lavatory, etc.

On the upper deck forward is a mast fitted with a 1½ ton derrick and an electric windlass which is also used as a winch for handling cargoes. There are three main watertight bulkheads subdividing the vessel into four main compartments. Plate angle bilge keels are fitted in order to avoid excessive rolling on the heavy sea.

Main and Auxiliary Machinery.—The main engine is an Ikegai four cycle single acting solid injection Diesel engine with four cylinders of 240 mm. in diam. and 380 mm. stroke, developing 150 b.h.p. at 360 r.p.m.

A cooling water pump, a bilge pump, a lubricating oil pump and four fuel oil pumps are directly driven by the main engine. The reversing gear is of a bevel wheel type and starting air is supplied by one 120 litre air bottle and one 60 litre auxiliary bottle.

(B). The "Towan Sabro Maru" to the "Towan Rokuro Maru."—These four vessels are of the same design, except that the first two are installed with Ikegai Diesel engines and operated between Misaki, a fishing port at the end of Miura Peninsula, and Tokyo, while the remaining two have a waterless hot bulb semi-Diesel engine and operated between fishing ports at Pacific coasts of Awa Peninsula and Tokyo.

The leading particulars are as follows :—

Length b.p.	75′-0″
Breadth mld.	15′-0″
Depth mld.	7′-0″
Mean loaded draught	5′-0″
Gross tonnage	60.81 tons.

Cargo hold capacity.—300 fish barrels, *i.e.* about 24½ tons.

B.H.P.	120
Speed	about 9 knots.

General arrangement is very similar to the *Towan Taro Maru* class, but no crew space is provided under the upper deck.

Main engines of the *Sabro Maru* and *Siro Maru* are Ikegai four cycle solid injection single acting trunk piston type Diesel engines with four cylinders of 220 mm. bore and 340 mm. stroke, developing 120 b.h.p. at 400 r.p.m. All auxiliaries are same as those of the *Taro Maru* class.

Main engines of the *Goro Maru* and *Rokuro Maru* are two cycle single acting solid injection trunk piston waterless type semi-Diesel engines with three cylinders of 13-in. bore and 14-in. stroke, developing 120 b.h.p. at 325 r.p.m. These engines were designed and built by the Nippon Hatsudoki Kaisha, Ltd. (Nippon Motor Manufacturing Company, Ltd.).

Very recently, the motor fish carrier *Kosoku Maru* has been completed in the Mitsubishi Hikoshima Dockyard to the order of the Associated Fisheries Co., Ltd. (Kyodo Gyogyoh Kabushiki Kaisha). Her actual performance having been very satisfactory, the same owners ordered from the Mitsubishi Yard four more ships of the same design. These are expected to be operated between Hakata, Shimonoseki and Osaka, the service speed being 13 knots, the time required for this service will be about 30 hours and a great saving of expense for transportation of raw fish to the largest western market of Japan is expected in comparison with the transportation by railways.

Many fishing companies engaging in the Northern Pacific fisheries are also planning to build many motor fish-carriers for the service between northern fishing centers and the districts of Tokyo.

These small high speed motor fish-carriers, however, have to navigate along rough Pacific coasts of North-Eastern Japan, so that special consideration is necessary to ensure the good seaworthiness and the safety of the vessels.

To be Continued)

American Insulation on Japanese Liners

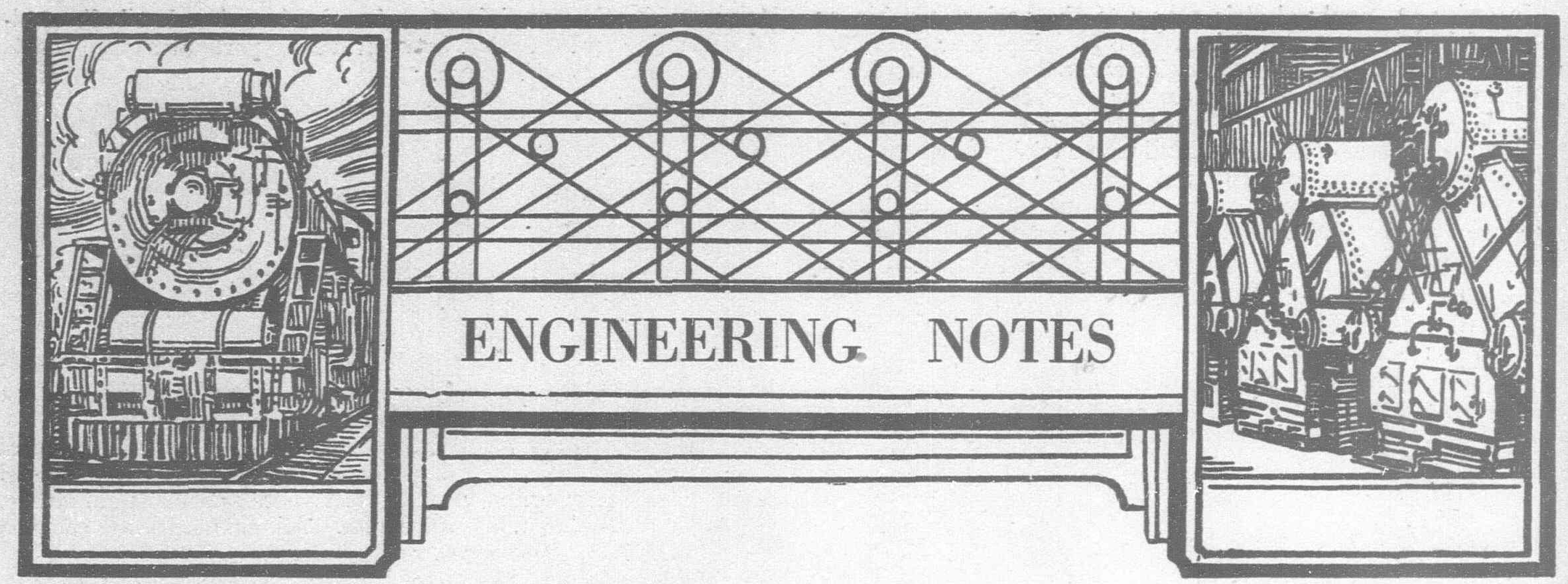
The nine new motorships recently built in Japan and added to the Nippon Yusen Kaisha fleet are splendid examples of modern, efficient naval architecture and marine engineering. The largest and the best known of these ships are the three beautiful passenger liners *Chichibu Maru, Tatsuta Maru,* and *Asama Maru* of the Orient-California Line.

Four of the nine ships are powered with Burmeister & Wain Diesels, and five with Sulzer Diesels.

The insulation of a Diesel exhaust line calls for a material which has all the attributes of a good pipe covering in addition to the ability to withstand the intense heat generated. It must be immune to vibration, it must be highly efficient with the minimum of thickness, and it must be proof against calcination.

The N. Y. K. engineers ordered, through the Chitose Trading Co., of Tokyo, who represent Johns-Manville in Japan, the necessary J-M Superex Block, sponge felted sheets and 450 and 302 cement to insulate the main engine exhausts on seven of the nine ships and the auxiliary engine exhausts on six. On every one of the nine ships some J-M insulation is playing an important part. The 302 cement is used as a finish over the Superex Blocks, and the 450 cement is used on the exhaust silencers. J-M sponge felted sheets is used over the Superex Block in certain places.

There are hundreds of instances of Johns-Manville insulation on Diesel engine exhaust and auxiliary lines both afloat and ashore, but the N. Y. K. installation, wherein J-M insulation is used on every one of nine new ships, is one of which that firm is particularly proud.



ENGINEERING NOTES

FINANCE AND TRADE

JAPAN ENTERS BRITISH MARKET—Japan is doing a thriving business in cheap rubber-soled boots and shoes. According to the South African Board of Trade, it became the leading supplier of the Union in 1930, exporting to that market no fewer than 1,441,689 pairs (valued at £92,585), compared with 81,034 pairs (at £6,474) in the previous year. It now exports to South Africa practically seven times the quantity of rubber shoes that Great Britain ships, though in 1930 the United Kingdom was the second largest exporter to Japan.

Urgent representations were recently made on the subject to the Board of Trade in the Union by the footwear and leather industries. The contention of the manufacturers is that a large proportion of the increased imports has displaced, and is still displacing, South African made leather footwear of the lower price type, such as whole cuts, sandals and veldskoons.—*Evening Standard*

PUBLIC WORK

SURVEYS IN CHINA.—A third survey party organized by the Huai River Conservancy Board has gone to Huaian (Tsingkiangpu), where surveys will be undertaken in preparation for repairs to the dykes along the Huai River. In this connection it is understood that the National Flood Relief Commission will employ refugee labor for the work as part of its scheme of relief, recruiting 20,000 refugees who will receive food and clothing besides wages. In accordance with the National Government's decision to develop the port of Haichow, a survey party under the leadership of Messrs. Hsu Peh-kuei and Chiang Li-sheng, engineers, arrived at Sinpu, a suburban town near Haichow and is proceeding to Hsukou where the proposed Haichow harbor will be located and where the party will commence their surveying work.—*Kuo Min.*

COMMUNICATIONS

NEW TELEPHONES.—The installation of new telephones at the rate of 23,000 a year is being planned by the Japanese Ministry of Communications, the extensions being carried out on a large scale at an expenditure of Y.130,000,000 to be raised by bond issues extending over 10 years. This plan was drawn up following the discovery that the undertaking can not be entrusted to private enterprise without a Government subsidy, according to the *Jiji Shimpo.* Whether the Government will sanction the scheme remains to be seen. In this connection it may be recalled that the establishment of a semi-Government telephone corporation was rejected by the Government when the matter was brought up last year. Other Government undertakings to be covered by the floatation of bonds includes the organization of bus feeder lines by the Ministry of Railways planned by Dr. Tasuku Egi. The plan is now held up due to the illness of the Minister but will be pushed to completion as soon as Dr. Egi's health improves.

BUS SERVICE STARTED.—It is learned that a motor bus service linking up Tihwa, the Sinkiang provincial capital, with Kalgan, the Chahar provincial capital, will shortly be inaugurated. Trial motor trips conducted between the two cities have proved satisfactory. When the service is in regular operation, a trip which now takes nearly a month may be effected in only 10 days. A consignment of ten motor buses ordered by the Sinkiang Provincial Authorities are on the way to Tihwa from Kalgan.

RAILWAYS

SIAMESE RAILWAYS.—The contract for the supply of points and crossings required by the Royal State Railways of Siam has been awarded to Messrs. Thomas Summerson and Sons of Darlington, England, at a price of £10,693.2-0 c.i.f. The contract for 1,000 tons of steel rails has been awarded to the same firm at a price of £10-12-0 per ton c.i.f.

BUYING EQUITMENT.—British reports say. The Chinese Ministry of Railways officially announces that the purchase of a large quantity of new equipment is contemplated, most of which will come from Britain.

The total order will be :

119 locomotives.
114 passenger coaches.
587 goods wagons.

The announcement does not state the method to be adopted for payment to British manufacturers, says the *British United Press.* In January it was announced that the Chinese Government had agreed to spend £3,000,000 of the Boxer Indemnity on British railway equipment for the rehabilitation of the Chinese railways, and it is possible that the new order may come under this agreement. A supplemintary report says. The Chinese Government Purchasing Commission have placed contracts for sixty 40 ton all-steel covered waggons with the Metropolitan Cammell Carriage, Wagon, and Finance Co., Ltd., of Saltley, Birmingham, and for sixty open-type waggons with Messrs. Hurst, Nelson & Co., Ltd., of Motherwell, Lanarkshire (states *Modern Transport*). All the waggons are required for service on the Tientsin-Pukow Railway.

TO COMPLETE RAILWAY.—It is reported that the Ministry of Railways has formulated a plan for completing the uncompleted section of the Canton-Hankow Railway, linking South China with the Central China provinces. The latest scheme provides for the building of the Shiuchow-Lochang section of the line within seven months. It is understood that the project will cost £170,000, and from the British Returned Boxer Indemnity Funds. In a statement made to the press, Mr. Yeh Kung-cho, Minister of Railways in the Sun Fo Cabinet, said that the new Government planned to carry out by stages Dr. Sun Yat-sen's Railway Development Scheme, which provides for the building of 100,000 miles of railways in China.

AVIATION

NEW SOVIET AIR LINES.—An extension of the airmail line Moscow-Irkutsk to Vladivostok is provided for in the program for 1932 of the Civil Aviation Administration. Under this program, 47 new air-lines, aggregating 14,000 miles, will be opened in the Soviet Union in 1932. Of these the new Irkutsk-Vladivostok line is one of the most important. According to the official announcement, mails between the capital and the Pacific seaboard will in future take only five days to reach their destination with an additional day for mails from and to Central Europe *via* the Moscow-Berlin line.

WANTS BRITISH AERO-ENGINES. The Japanese Government, says The *Glasgow Herald*, has opened negotiations in this country for the supply of a number of 825 horse power aircraft engines for installation in her flying boats. Many of Japan's seaplanes already carry British engines, but the type which is now sought would so increase the speed of her 'planes as to rank them with the fastest Service machines in the world. Mr. A. F. Sidgreaves, managing director of Rolls Royce, who spoke of the inquiries which had been made from Japan, said that while the skeleton flying boats would be built in Japan according to Japanese design, the engines, if the deal is completed, would be constructed in this country and installed in the 'planes by British workmen who would be sent to the Far East for that purpose. The inquiry, he suggested, pointed directly to Japanese appreciation of recent advances in aero-engine design and their determination to keep abreast with the rest of the world.

SHIPPING

SOVIET OIL FOR CHINA.—The third tanker with a consignment of Russian oil and gasoline for Shanghai left Batum early in January, according to a report published by the *Eskonomitcheska Shisn.* The tanker, a Norwegian vessel, is carrying 10,000 tons and is expected to reach Shanghai next month.—*Trans-Ocean Kuo Min.*

TRANS-PACIFIC FARES CUT.—The American Mail Line has announced that effective immediately, it is possible to travel from Shanghai to Seattle in a first class cabin with a private bath for as low as G.$389.00. This rate applies to the President steamers. *Taft, Madison, Cleveland* and *Jefferson,* which maintain a fortnightly service from Oriental ports to Victoria and Seattle. There have been many major cuts in the American Mail Line's passenger fares recently. A ticket may now be purchased in a special class cabin for G.$185.00 Shanghai to Seattle. An innovation in the American Mail Line's special class is cabins with private bathrooms attached for G.$250.00.